



February 6, 2025

Ms. Carolyn F. Ross
Senior Planner
RFA Planning Consultants Inc.

Re: Response to Peer Review Comments provided by the Ministry of Transportation (MTO) and Stantec on the Traffic Impact Study (TIS) report for the proposed Upper Mill Pond Development, 42/52 Mill Street, Norwood, Township of Asphodel-Norwood, County of Peterborough

As requested, we have reviewed the comments (Appendix A) provided by the Ministry of Transportation (MTO) and by Stantec on behalf of County of Peterborough based on the Traffic Impact Study Report dated January 26, 2024 completed by Tranplan for the proposed Draft Plan of Subdivision of Upper Mill Pond Development located at 42/52 Mill Street. This letter provides our response to the comments (given below) and follows the same numbering as the comments matrix.

In addition to the peer review comments responses, the following revisions were made to the previous study.

1. Background Traffic

- Updated Trip Generation calculations for background developments, 67 Mill Street and 112 Mill Street to reflect use of appropriate ITE Land Use Codes.
- Updated Exhibits 2.7B, and 2.7C (see Appendix B) to illustrate revised background site traffic volumes from 67 Mill Street and 112 Mill Street.
- Updated Exhibits 2.8, 2.9, 2.10 (see Appendix B) to illustrate revised total background traffic volumes for all three planning horizons.
- Updated Intersection Capacity Analysis of background traffic conditions using revised traffic volumes. As in the previous study, the Highway 7 intersections were assessed with a lane capacity of 1750 vehicles per hour per lane and using the observed peak hour factors per turning movement. The County of Peterborough and the Township of Asphodel-Norwood intersections were assessed using Synchro default values (1900 saturation flow rate and 0.92 peak hour factor). The updated Synchro reports are



enclosed in Appendix D.

- Updated Table 4.1 (Summary of Intersection Capacity Analysis-Background Conditions). See Appendix C.

2. Traffic Generation by the Proposed Development and Future Total Traffic

- Updated Trip Generation calculations for the proposed development using appropriate ITE Land Use Codes (see revised Table 3.1 in Appendix C).
- Updated Exhibits 3.1A, 3.1B and 3.1C (see Appendix B) illustrating revised site traffic volumes from the proposed development.
- Updated Exhibits 3.2, 3.3, 3.4, 3.5 (see Appendix B) illustrating revised future total traffic volumes for all three planning horizons.
- Updated Intersection Capacity Analysis of total traffic conditions using revised traffic volumes. The Highway 7 intersections were assessed with a lane capacity of 1750 vehicles per hour per lane and peak hour factor of 0.92 per turning movement. The County of Peterborough and the Township of Asphodel-Norwood intersections were assessed using Synchro default values (1900 saturation flow rate and 0.92 peak hour factor). The updated Synchro reports are enclosed in Appendix D.
- Updated Table 4.3 (Summary of Intersection Capacity Analysis-Total Conditions). See Appendix C.

Response to MTO comments, April 12th, 2024:

MTO Comment#1:

The Trip Generation calculations are revised and attached in Appendix C.

MTO Comment#2:

A review of the Traffic Signal Warrant, Justification 7, was conducted for 2034 & 2039 total traffic volumes at the intersections of Highway 7 with Cedar Street and Elm Street in accordance with Ontario Traffic Manual (OTM) Book 12. Detailed calculations of Average Hourly Volumes and the justification tables are provided in Appendix E. Traffic signals are not warranted at the intersections of Highway 7 with Cedar Street and Elm Street.



MTO Comment#3:

Our review of the Highway 7 & CR45/40 intersection indicates that there isn't significant improvement in theoretical operations with signal timing adjustments for all the horizon years. It is recommended that MTO, County and Township collaborate to plan and implement studies to improve the existing geometric and capacity constraints at this intersection. The removal of a few on-street parking spaces and providing additional through lanes where possible could be an option to be considered and reviewed.

MTO Comment#4:

We acknowledge that it would be difficult for large trucks to maneuver around the corner with the addition of an eastbound right-turn lane. It is likely that trucks currently face maneuvering issues with the existing geometrics at this eastbound approach.

MTO Comment#5:

The intersection capacity analysis was performed for all future total traffic scenarios with a saturation flow rate of 1750 for the Highway 7 lane. Please see attached Synchro reports in Appendix D.

Response to Stantec Comments, May 28,2024:

Stantec Comment#1:

The Victoria Street slip lane was assessed as a northbound right turn lane with a stop control at the intersection of County Road 45 with Alma Street. See revised Exhibit 2.1 (Appendix B). The revised intersection capacity analysis results are shown in Table 2.1, 4.1 and 4.3 (Appendix C). See Appendix D for corresponding Synchro results.

Stantec Comment#2:

The auxiliary left-turn lane at the northbound approach of Highway 7 and CR 40/45 intersection is shown in Exhibit 2.1, enclosed in Appendix B. The capacity analysis results are consistent with the current lane configurations.

Stantec Comment#3:

The northbound approach of County Rd. 45/40 and Highway 7 intersection currently has two lanes, an exclusive left turn lane and a shared through-right turn lane. However, in practice, due to on-street parking, the through and right turning vehicles also queue along the left lane from where the on-street parking begins (15 metres from the intersection).



As a result, the effective storage length of the left turn lane is limited to 15 meters. For Synchro modeling, this 15-meter storage length was applied to both the left turn lane and the shared through-right turn lane. According to the Synchro analysis, northbound traffic is expected to queue as far back as Spring Street. The anticipated incremental increase in future traffic along Highway 7 corridor with the upcoming developments in Norwood will gradually create capacity constraints and congestion at this intersection. It is recommended that the Township, County, and MTO collaborate to plan and implement future improvements to address the expected capacity and geometric constraints, ensuring the intersection can accommodate planned developments in the Village of Norwood area. One of the recommended options would be to restrict on-street parking during the busiest peak hours of traffic.

Stantec Comment#4:

The trip generation calculations of the background developments (67 Mill Street and 112 Mill Street) were revised to represent appropriate ITE land use codes and the revised trip generation details are enclosed in Appendix C.

Stantec Comment#5 :

The proposed development includes a total of 640 residential units and 1,842 m² (19,827 ft²) of commercial GFA. The residential units are further classified into;

- 196 single detached dwelling units
- 124 multi-family dwelling units (stacked townhouses, apartments)
- 134 2-storey townhouses
- 70 bungalow townhouses
- 116 4 plex bungalow units

Stantec Comment#6 :

Tranplan acknowledges Stantec's recommendation on the appropriate ITE land use codes to be applied for the residential units. The revised trip generation calculations are shown in Table 3.1 (enclosed in Appendix C).

Stantec Comment#7:

Site traffic from the proposed Upper Mill Pond development (as well as the lands formerly known as the Crowley Farms) do not have (a reasonable) direct access roads to Highway 7/County Road 45/40 intersection. The traffic is expected to travel on Mill Street, then on through King Street and/or Queen Street before turning onto another local street to get to



Highway 7 and/or County Road 45. While Mill Street does connect directly to Highway 7, due to current sub-standard road conditions and the railroad underpass narrowing to a single lane width along with sightline issues at the Highway 7 intersection, MTO suggested (at the time of Crowley Farms re-zoning approval) that Mill Street not be improved to carry additional traffic from future development lands. Rather, the travel on Mill Street (between Queen Street and Highway 7) be restricted (through one-way travel by restricting incoming traffic, traffic calming, traffic operation restrictions at Highway 7, such as no left turn) to limit the number of vehicles using Mill Street to access Highway 7 corridor. It was understood that MTO and the Township decide on measures to limit access to Highway 7 at the appropriate time. The study trip distribution reflects the concerns raised previously by MTO regarding Mill Street/Highway 7 intersection.

Stantec Comment#8:

We acknowledge that the County's Traffic Impact Assessment (TIA) Guidelines include procedures for generation of internal capture trip reduction percentages. However, the type of use that may occupy the commercial block of this development is not finalized yet and hence the internal capture trip reductions percentages were assumed for planning purposes only. A more appropriate internal capture percentages will be assessed and presented in an addendum report during the Site Plan Approval stage.

Stantec Comment#9:

A northbound right turn taper/lane is not required at the County Road 45/Alma Street intersection as the Victoria Street slip lane functions as a northbound channelized right turning lane.

Notwithstanding the above responses, the revised trip generation calculations and corresponding updates have not resulted in significant changes to the initial study findings and conclusions.

Please do not hesitate to contact to discuss if you have any questions.

Yours truly,

Sreelakshmi Changaradil, P.Eng.





Reviewed by,

Seo-Woon (Swan) Im, B.E.S
Senior Transportation Planner
Tranplan Associates

This document is produced for planning purposes only.

TECHNICAL APPENDIX

APPENDIX A

PEER REVIEW COMMENTS

Ministry of Transportation

Corridor Management Section
1355 John Counter Boulevard
Postal Bag 4000
Kingston, Ontario K7L 5A3
Tel.: 613-483-5307
George.Taylor2@ontario.ca

Ministère des Transports

Section de gestion des couloirs routiers
1355, boulevard John Counter
CP/Service de sacs 4000
Kingston (Ontario) K7L 5A3
Tél.: 613-483-5307
George.Taylor2@ontario.ca



12 April 2024

Malini Menon

Planning
County of Peterborough
(705) 743-0380 ext. 2404

Via email: mmenon@ptbocounty.ca

Dear Ms. Menon,

Re: Draft Plan of Subdivision

42/52 Mill Street, Norwood, Township of Asphodel-Norwood, County of Peterborough
MTO-LD-2024-43S-000080

Ministry of Transportation (MTO) is in receipt of the Draft Plan of Subdivision in support of the proposal to construct 630 residential units on the above noted subject lands. The ministry has reviewed all the documentation submitted to the Highway Corridor Management System (HCMS)

All MTO concerns have been satisfactorily address regarding the Stormwater Management Report and Functional Service Report.

The Ministry offers the following comments regarding the Traffic Impact Study:

- For the a.m. peak hour, please recalculate the site generated trips for Land Use Code 210 (Single Family Detached Housing), as they do not appear to be correct.
- Due to the projected increased delays at Hwy 7 & Cedar St, as well as at Hwy 7 & Elm St, are traffic control signals warranted at these two intersections? Please review and revise the report/appendices as necessary.
- Due to the projected increased delays at Hwy 7 & CR40/CR45, would signal timing adjustments improve the theoretical intersection operating conditions for all the horizon years? Please review and revise the report/appendices as necessary.
- In addition, if a new eastbound right turn lane was added, it would likely be difficult for large trucks to manoeuvre around this corner.
- As detailed in Appendix A1, we feel that a saturation flow rate of 1750 is more appropriate for Norwood. Please ensure that an intersection capacity analysis is completed (with a saturation flow rate of 1750) for all total future scenarios, as this was omitted in the TIS submission.

The Ministry requests that the proponent review and address the above comments.

Once the Ministry's concerns have been addressed the Ministry would be able to instruct the proponent to apply for a Building and Land Use and Signage permits for the proposal.

The Ministry does advise that should there be any changes to any of the previously submitted documentation, that Ministry review and approvals are required prior to implementation of any changes.

Please note that this letter is not a permit to begin construction. MTO permit is required prior to the construction and prior to the issuance of any municipal building permits or approvals as per section 8. (2) (a) of the Building Code Act.

If you have other questions relating this matter, please feel free to call me at (613) 483-5307 or email me at George.Taylor2@ontario.ca.

Sincerely,

George Taylor
Corridor Management Planner
Ministry of Transportation
Kingston, ON



Stantec Consulting Ltd.
300W – 675 Cochrane Drive
Markham ON L3R 0B8

May 28, 2024

File: 160900933.303

Attention: Malini Menon, B.E.S., Planner

County of Peterborough
470 Water Street
Peterborough, ON, K9H 3M3

Dear Ms. Menon,

Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

1 Introduction

Stantec has been retained by the Peterborough County ("the County") to conduct a peer review of the Traffic Impact Study ("TIS") report for the proposed Upper Mill Pond Development, a residential and commercial development in the Village of Norwood. This TIS report was submitted by Tranplan Associates ("the Consultant") on behalf of CAP Norwood Developments Inc. ("the Developer") on January 26, 2024.

The proposed residential and commercial development site, hereby known as the subject site, is located on the north side of Mill Street, south of the rail line between King Street and Asphodel 10th Line, in the general area located on the northeast quadrant of the Mill Street and King Street intersection, in the Village of Norwood, in the Township of Asphodel-Norwood, County of Peterborough. Figure 1 shows the development site in relation to the surrounding road network and the Village of Norwood. The subject site is currently farmland.

Based on the proposed site plan of the subject site, which was included in the TIS report and is shown in

Figure 2, the subject site covers a total area of approximately 35.5 hectare. The proposed development includes a mixture of 196 single detached houses, 70 bungalow townhouses, 134 2-storey townhouses, 116 four-plex bungalow units, 24 3-storey stacked townhouse units, 60 3-storey building units, and a 3-storey mixed-use building with 40 dwelling units and 1,842 m² of at-grade commercial floor space.

The subject site is envisioned to be accessed from King Street and Mill Street along the south side of the site via two future new site accesses – Street A and Street C, and from Asphodel 10th Line on the east side of the site via Street A. There is also a driveway access to the mixed-use building at the southwest corner of the site from Mill Street.

The TIS assumes that the proposed development will be built out by 2029. The build-out year (2029), as well as the years 2034 and 2039 – which represents 5 years and 10 years following build-out, respectively – were selected as the planning horizon years.

Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

The intersection analysis includes the following scenarios:

- Existing conditions (2023), in the summer peak weekday AM and PM peak hours.
- Future background conditions (i.e. conditions without the proposed development) at all planning horizon years, in the summer peak weekday AM and PM peak hours.
 - The build-out year (2029) future background condition included two scenario subsets:
 - Highway 7 intersections were analyzed with a saturated flow rate of 1,750 vehicles per hour per lane (vphpl) and peak hour factors (PHF) calculated based on the observed turning movement volumes. These criteria were requested by the MTO and considered to be more representative of traffic operations in the rural area.
 - Highway 7 intersections were analyzed with a saturated flow rate of 1,900 vphpl and a PHF of 0.92 for all turning movements. These criteria are Synchro default values, which were considered by the Consultant as representative of motorists' behaviours typically observed in urbanized areas. These criteria were also used in all county and local road intersections.
 - Future background conditions in the planning horizons of 2034 and 2039 were analyzed with Synchro default saturated flow rate (1,900 vphpl) and PHF (0.92) for all turning movements.
- Future total conditions (i.e. conditions with the proposed development) at all planning horizon years, in the summer peak weekday AM and PM peak hours
 - Synchro default saturated flow rate (1,900 vphpl) and PHF (0.92) were applied for analyses at all planning horizon years.

The intersection analysis found that the eastbound through-right lane at the Highway 7 and County Road (CR) 45/40 intersection operates at a critical level (according to the County's *Traffic Impact Assessment Guidelines*, a volume-to-capacity ratio that exceeds 0.85) for all planning horizons under the future background conditions and deteriorates to over-capacity (i.e. volume-to-capacity ratio exceeding 1.0) for all planning horizons under the future total conditions.

To mitigate the critical traffic operations at the Highway 7 and CR 45/40 intersection, the TIS recommends providing an eastbound right-turn lane to the intersection. The Highway 7 eastbound approach was observed to have sufficient road width to accommodate a right-turn lane, but the road width is currently occupied by on-street parking and a single through-right lane. The TIS recommends that the Township, County and MTO conduct area wide studies to address the traffic and parking requirements associated with current and future needs and development plans in the Township, especially in the Village of Norwood urban area.

The TIS also includes a sightline analysis and an intersection spacing analysis based on the proposed access roadways in the site plan. The TIS found that there is currently a knoll just to the east of the proposed Mill Street and Street C intersection that reduces available sightline distance at this access to below minimum required levels, but that the approved reconstruction of Mill Street is expected to provide sufficient sightline distance at this access. The intersection spacing analysis found that all proposed access roads and driveways meet the minimum spacing requirements.

This peer review report provides a review of the methodology, technical analysis, findings, and recommendations presented in the TIS report and is prepared solely based on the content of the TIS report and its appendices. While spot-checks on calculations were undertaken to confirm the study was prepared using industry accepted practice and appropriate methodology, Stantec does not take liability for any omissions/exceptions that the Consultant may have made throughout their assessment.

Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

Figure 1 Map of Vicinity of Proposed Development Site (Source: Exhibit 1.1 of the TIS)



Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

Figure 2 Proposed Site Plan of the Development (Source: Exhibit 1.2 of the TIS)



Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

2 Existing Conditions

2.1 The Study Site

COMMENT 1

Stantec Comment: In *Exhibit 2.1 – Existing Traffic Control and Lane Configuration*, in all intersection capacity analysis tables in the report that assessed this intersection (*Table 2.1, Table 4.1, and Table 4.3*), and in the corresponding *Appendix B: Intersection Analysis Summaries*, the northbound CR45 to Victoria Street slip lane and stop control were not considered in the intersection analysis of the CR45 and Alma Street intersection. As illustrated in Figure 3, under the existing configuration, the length of the slip lane between the stop line and CR45 is less than 25 metres. The stop control at this slip lane may result in vehicle spillback onto the northbound through traffic lane. To assess the potential impact of increased northbound right-turn movements, it is recommended that an updated intersection analysis of the CR45 and Alma Street intersection be conducted with an auxiliary northbound right-turning lane with stop control.

Figure 3 Length of Northbound Right Slip Lane at County Rd 45 and Alma Street/Victoria Street (Source: Google Maps)



Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

1.4 Existing Conditions / Level of Service (LOS)

COMMENT 2

Stantec Comment: In all intersection capacity analysis tables in the report (*Table 2.1, Table 4.1, Table 4.2, Table 4.3, and Table 4.4*), and in the corresponding *Appendix B: Intersection Analysis Summaries*, the Highway 7 and CR40/45 intersection was coded with an auxiliary left-turn lane in the northbound left movement, with a storage length of 15 metres. This is inconsistent with what is displayed at this intersection in *Exhibit 2.1 – Existing Traffic Control and Lane Configuration*. It is recommended that the TIS be updated to correct this consistency.

COMMENT 3

Stantec Comment: In all intersection capacity analysis tables in the report (*Table 2.1, Table 4.1, Table 4.2, Table 4.3, and Table 4.4*), and in the corresponding *Appendix B: Intersection Analysis Summaries*, the northbound left movement at the Highway 7 and CR40/45 intersection exhibit a 95th percentile queue that exceeds the storage length coded (15 metres) for both AM and PM peak hours. However, no reference to this critical movement is included in the report. Please comment on the traffic operations at this movement in the updated report and provide recommendations as needed.

3 Traffic Forecasts

3.1 Background Traffic

COMMENT 4

Stantec Comment: Two background developments – Norwood Park Phase 4 Residential Development, Proposed Residential Development at 67 Mill Street and at 112 Mill Street – are included as part of future background traffic. It is recommended to include excerpts of these report as an appendix to the TIS report to provide reference for the details of trip generation based on these background developments.

3.2 Traffic Generation by the Proposed Development

COMMENT 5

Stantec Comment: It is stated that the proposed development includes 240 3-storey multi-unit buildings. This value is inconsistent with the distribution of unit types illustrated in the proposed site plan in Figure 2, which specifies that there are 24 3-storey 116 four-plex bungalow units, 24 3-storey stacked townhouse units, 60 3-storey building units, and a 3-storey mixed-use building with 40 dwelling units. Please comment on this discrepancy and update the traffic generation by the proposed development accordingly.

Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

COMMENT 6

Stantec Comment: In *Table 3.1: Trip Generation by the Proposed Development*, the following land use categories from the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition* were utilized for each proposed land use type:

- 196 single detached houses – Single-Family Detached Housing (LU 210)
- 204 townhouses and 240 multi-plex/apartments – Multifamily Housing (Low-Rise) Not Close to Rail Transit (LU 220)
- 1,842 m², or 19,827 ft², of gross floor area (GFA) – Strip Retail Plaza (<40K) (LU 822)

These selected land-use categories do not correspond to the distribution of unit types illustrated in the proposed site plan in

. Stantec recommends the following ITE land use categories to be incorporated for each proposed land use type:

- 196 single detached houses – Single-Family Detached Housing (LU 210)
- 70 bungalow townhouses, 134 2-storey townhouses, 116 four-plex bungalow units – Single-Family Attached Housing (LU 215)
- 24 3-storey stacked townhouse units, 60 3-storey building units, and a 3-storey mixed-use building with 40 dwelling units – Multifamily Housing (Low-Rise) Not Close to Rail Transit (LU 220)
- 1,842 m², or 19,827 ft², of at-grade commercial floor space – Strip Retail Plaza (<40K) (LU 822)

In addition, the trip generation estimate for the 196 single detached houses associated with LUC 210 appears to be incorrect for the AM peak hour – 88 trips shown in the TIS, versus 137 trips generated from Stantec's recommendations.

A minor difference in trip generation estimate is also observed for LUC 822, in which trips generated via the average rate method is higher than trips generated via the fitted curve method.

Table 1 below summarizes the difference in trip generation between the current estimate in the TIS and under Stantec's estimate recommendations.

Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

Table 1 Comparison of Proposed Development Trip Generation Estimates in the TIS and under Stantec's Recommendation

TIS				Stantec's Recommendations			
Land Use	Units / GFA	Generation Equation / Trips Generated		Land Use	Units / GFA	Generation Equation / Trips Generated	
		AM Peak Hour	PM Peak Hour			AM Peak Hour	PM Peak Hour
LUC 210	196	$\text{Ln}(\text{T}) = 0.91\text{Ln}(\text{X}) + 0.12$	$\text{Ln}(\text{T}) = 0.94\text{Ln}(\text{X}) + 0.27$	LUC 210	196	$\text{Ln}(\text{T}) = 0.91\text{Ln}(\text{X}) + 0.12$	$\text{Ln}(\text{T}) = 0.94\text{Ln}(\text{X}) + 0.27$
		88	187			137	187
LUC 220	444	T = 0.31(X) + 22.85	T=0.43(X)+22.55	LUC 215	320	T = 0.52(X) - 5.7	T = 0.6(X) - 3.93
						161	188
		160	213	LUC 220	124	T = 0.31(X) + 22.85	T=0.43(X)+20.55
						61	74
LUC 822	19.827 (1,000 ft²)	$\text{Ln}(\text{T}) = 0.66\text{Ln}(\text{X}) + 1.84$	$\text{Ln}(\text{T}) = 0.71\text{Ln}(\text{X}) + 2.72$	LUC 822	19.827 (1,000 ft²)	T = 2.36(X)	T = 6.59(X)
		45	127			47	131
Total Trips Generated:		294	527	Total Trips Generated:		406 (+112)	580 (+53)

Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

The cumulative differences in trip generation due to the listed discrepancies and factors are considerable, with an additional 112 trips generated in the AM peak hour and an additional 53 trips generated under Stantec's recommended estimation.

It is recommended that trip generation calculations be revised, and subsequent analyses be updated accordingly.

3.3 Direction Orientation of Site Traffic

COMMENT 7

Stantec Comment: It is stated that the directional orientation of the site-generated traffic is expected to be similar to the existing trip patterns observed at the study intersections and consistent with the population distribution within commuting distance. However, no further details on the distribution methodology on the residential or commercial trips are provided.

The TIS assigns development trips mainly to King Street and Queen Street. These roads are local streets providing multiple direct drive-way access points to low-density residential houses and should not be used as main site access route. The additional through traffic generated by the site on these roads can cause safety concerns and also will impact residents' neighborhoods. Site traffic should be assigned to Mill Street and then to Highway 7, as these roads will be the primary routes for site residents. Local roads like Queen Street and King Street should only be used if the more suitable routes, like Mill Street and Highway 7, and their intersection, fail to operate effectively.

The TIS should study and identify appropriate mitigations at the intersection of Highway 7 and Mill Street as one of its main outputs. The developer should be responsible for providing all required mitigations at this intersection to make sure it operates without issues and prevent site-generated traffic from infiltrating the local residential roads. We recommend that this TIS be revised to consider the proper road assignment.

COMMENT 8

Stantec Comment: In *Exhibit 3.1B: Site Traffic AM, PM Peak Hour Distribution and Volumes*, internal capture trip reduction percentages were applied to the site-generated commercial trips – 20% within the development, 20% to/from 67 Mill Street and 112 Mill Street development, and 10% to/from the existing residential area south of Mill Street along King Street and along Queen Street. However, no information or justification on these trip reduction percentages was provided. It is recommended that this information be provided in the updated TIS.

Note that the County's *Traffic Impact Assessment (TIA) Guidelines* include procedures that should be followed in the generation of internal capture trip reduction percentages.

Reference: Peer Review - Traffic Impact Study – Upper Mill Pond Development, Township of Asphodel-Norwood, County of Peterborough, ON

4 Analysis of Projected Traffic Volumes

4.1 Auxiliary Lane Analysis

COMMENT 9

Stantec Comment: It is stated that the right turn taper/lane warrant was conducted at the CR45 and Alma Street intersection. However, this corresponding result was not included in Appendix E. It is recommended that this warrant result be provided in the appendix.

Based on the above, this TIS report prepared in support of the proposed development (Upper Mill Pond) was found to contain discrepancies and unsupported assumptions – particularly in the site traffic generation and orientation sections – that may have an impact on the results of the intersection analysis and associated recommendations and future transportation requirements. The intersection analysis also identified critical queues at the Highway 7 and CR 45/40 that were not addressed. As a result, the impact of the proposed development on the adjacent road network may not have been satisfactorily assessed. It is recommended that the County request an updated TIS from the applicant to address the items reported in this Peer Review.

Sincerely,

Stantec Consulting Ltd.

Wilson Yip M.Eng. B.A.Sc.
Senior Transportation Planner
Phone: 416 507 3479
wilson.yip@stantec.com

Arash Mirhoseini M.Sc., P.Eng., PMP
Senior Associate, Transportation
Phone: 416-722-8270
arash.mirhoseini@stantec.com

APPENDIX B

REVISED EXHIBITS

EXISTING CONDITIONS

Exhibit 2.1: Existing Traffic Control and Lane Configurations



Signalized Intersection

Stop Control

Dedicated Left Turn Lane

Dedicated Right Turn Lane

Dedicated Through Lane

Shared Thru, L and R Lane

Shared Through and Left Turn Lane

Shared Through and Right Turn Lane

BACKGROUND CONDITIONS

Exhibit 2.7B: Other Development Traffic Volumes (External)

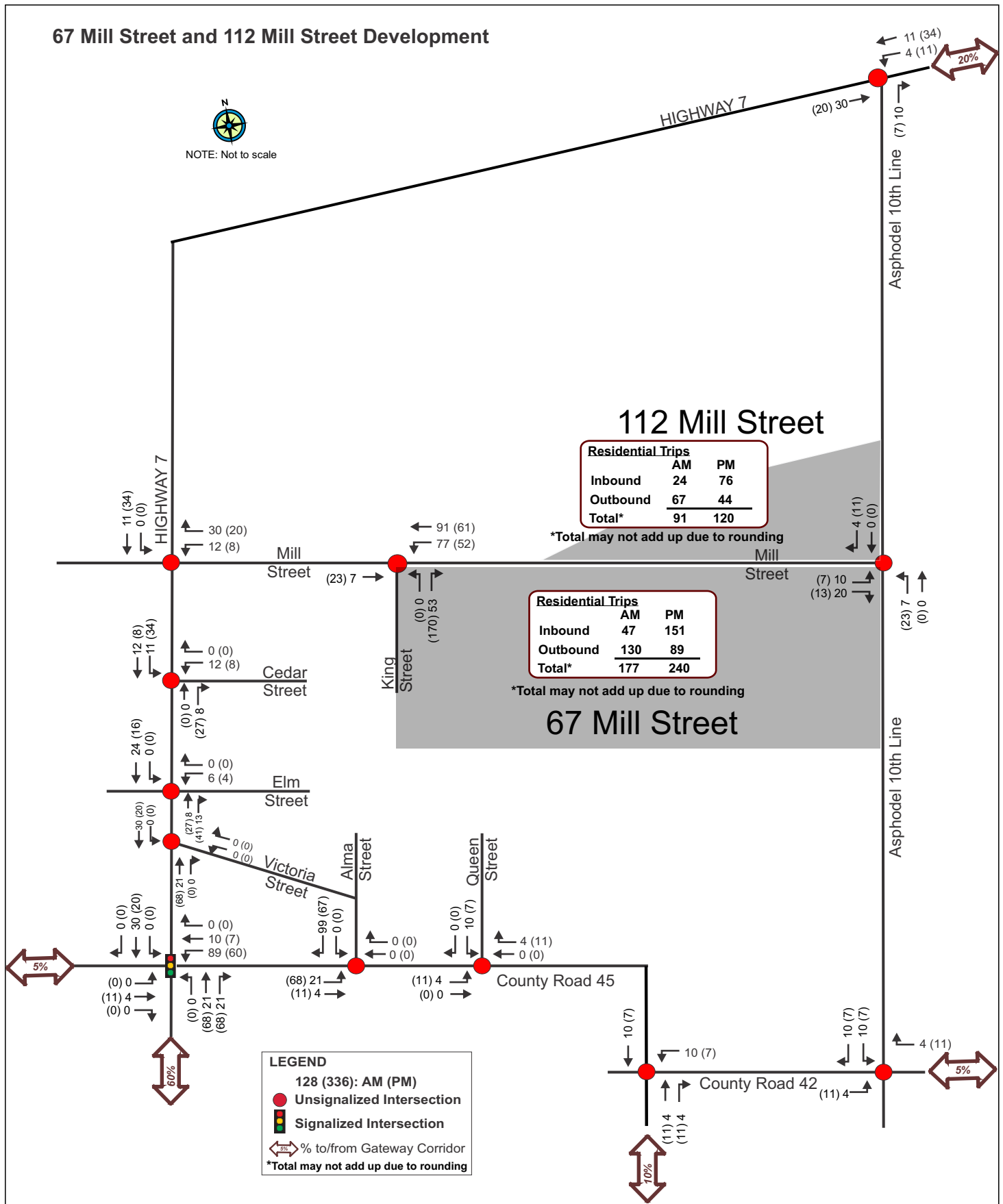
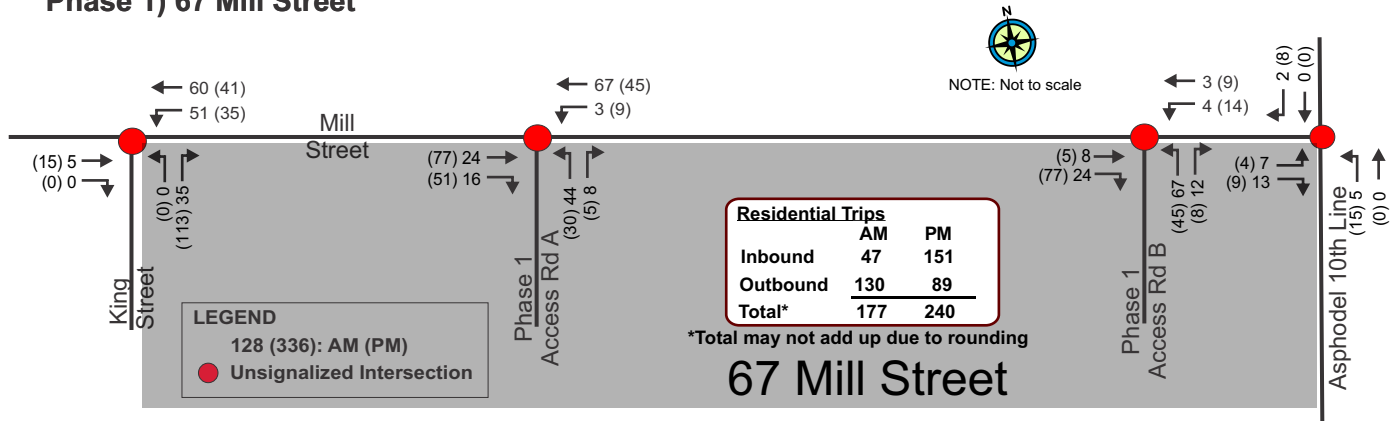
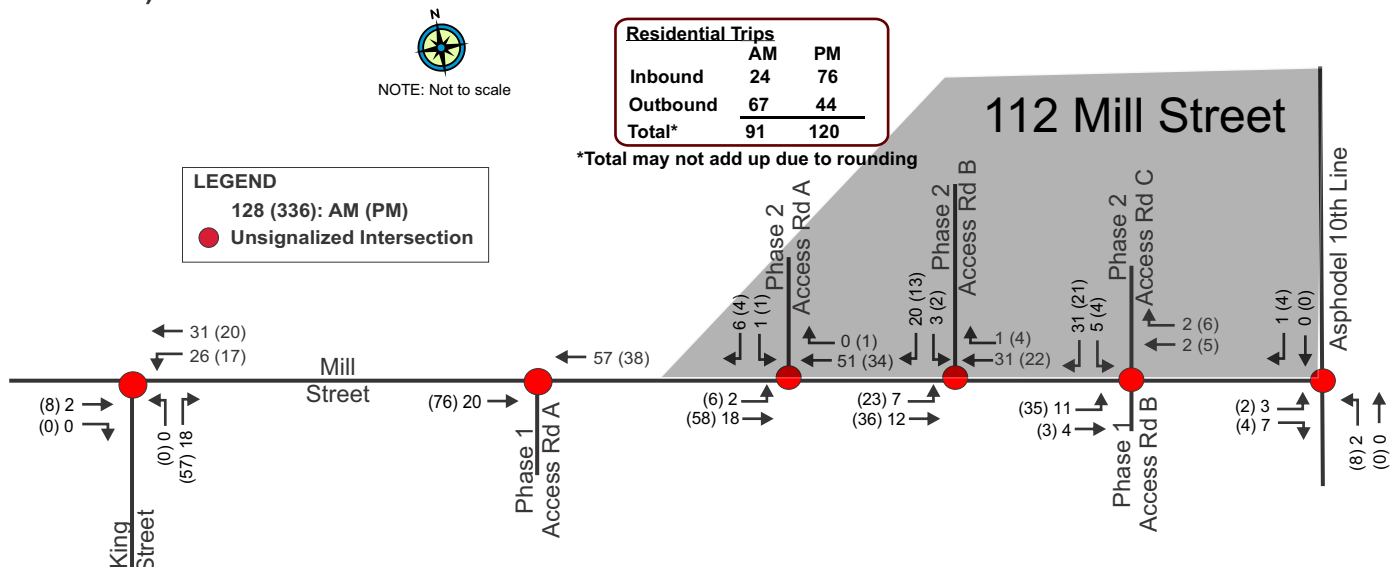


Exhibit 2.7C: Other Development Traffic Volumes (Mill Street)

Phase 1) 67 Mill Street



Phase 2) 112 Mill Street



Total Phase 1+2

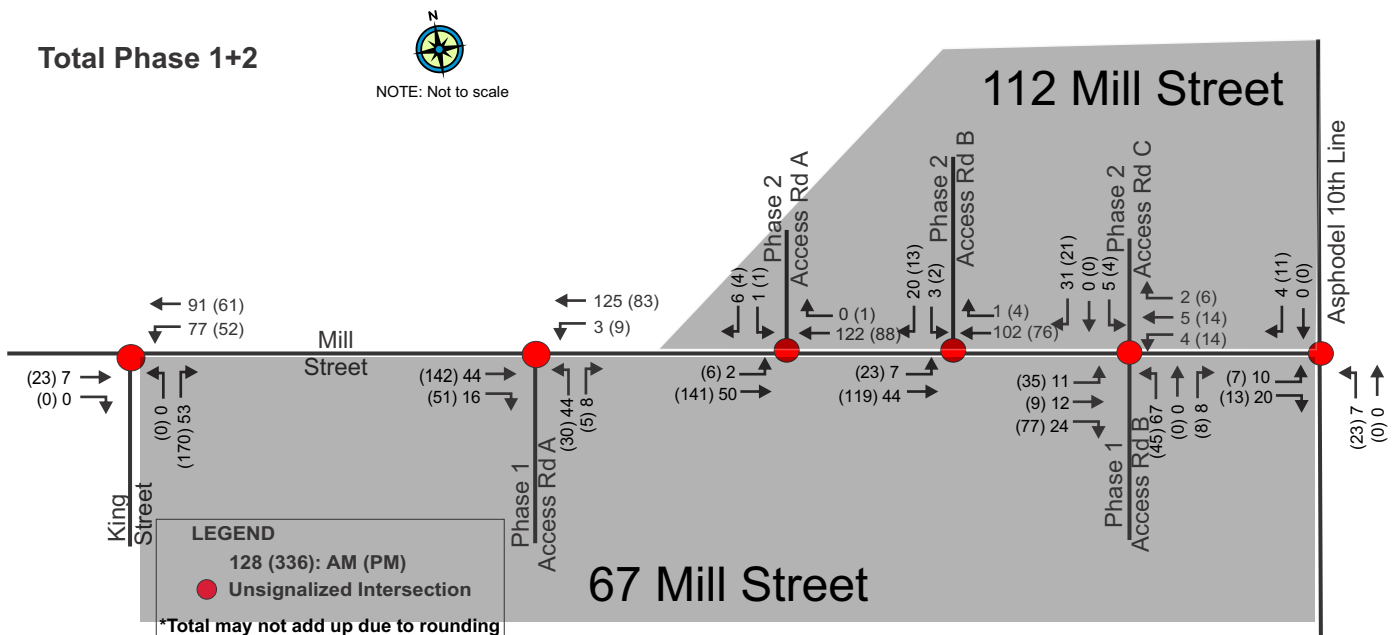


Exhibit 2.8: 2029 Total Background Traffic Volumes

2029 Total Background Traffic Volumes

1% increase in background traffic volumes + Other Developments



NOTE: Not to scale

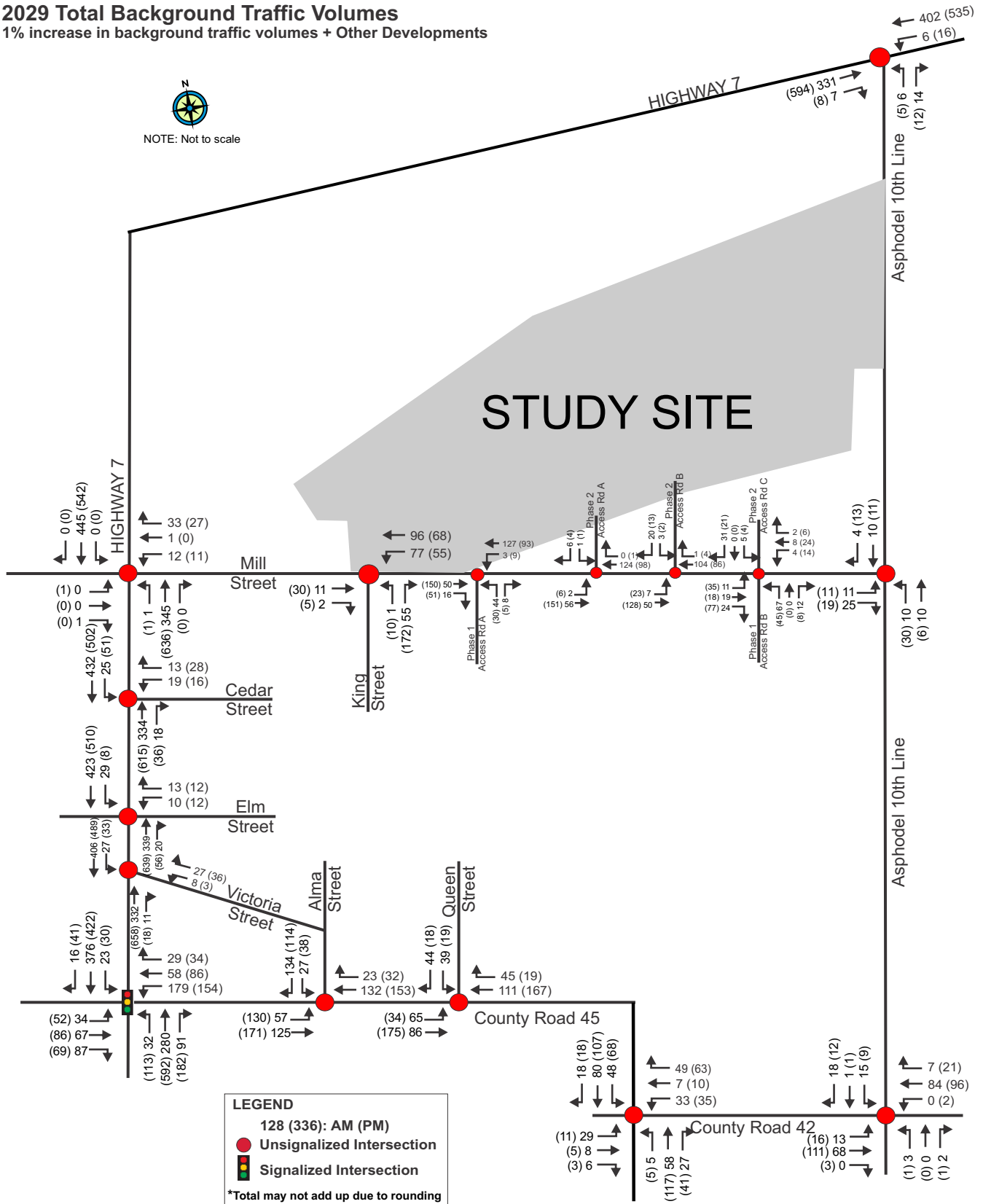


Exhibit 2.9: 2034 Total Background Traffic Volumes

2034 Background Traffic Volumes

1% increase in background traffic volumes + Other Developments



NOTE: Not to scale

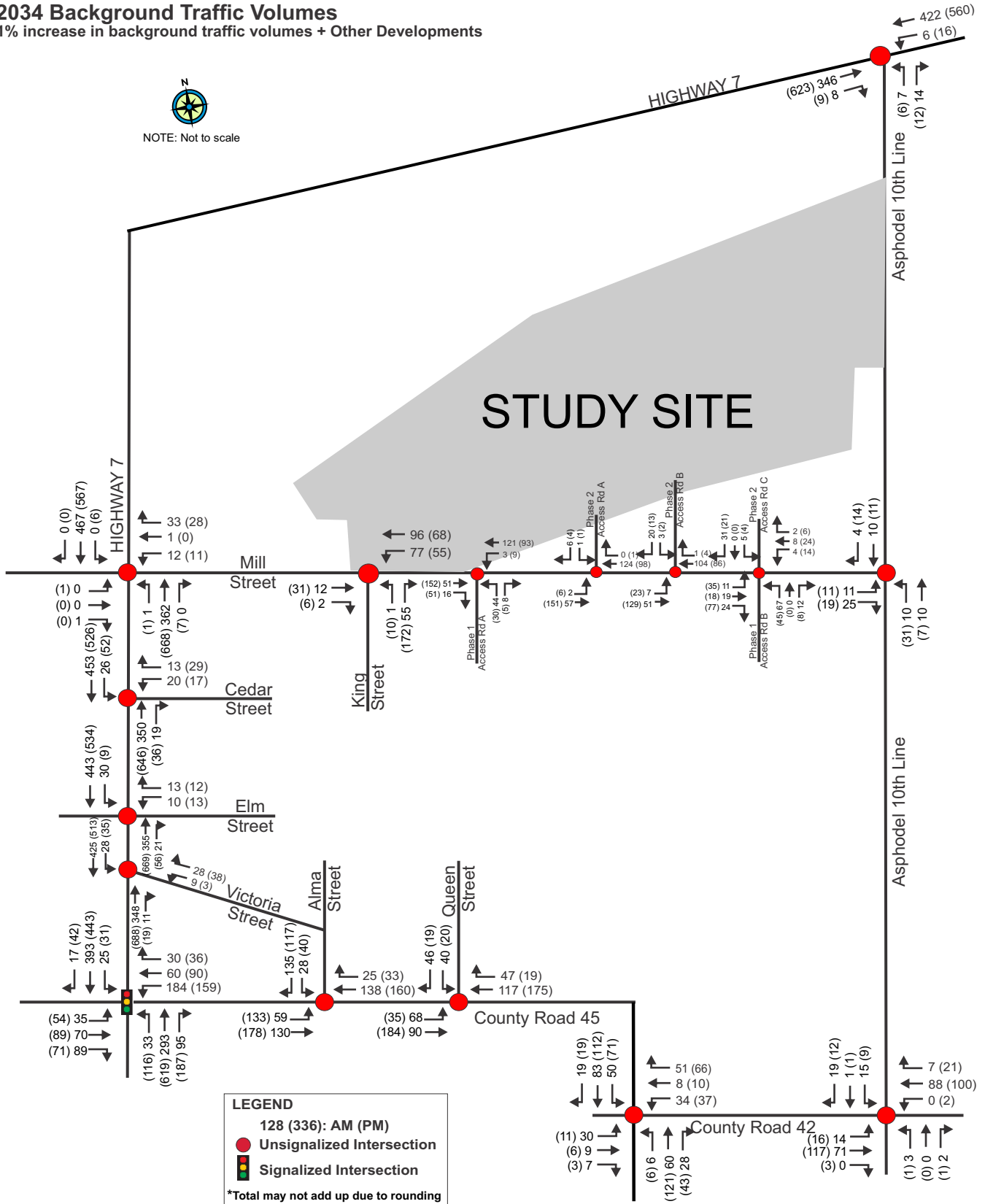


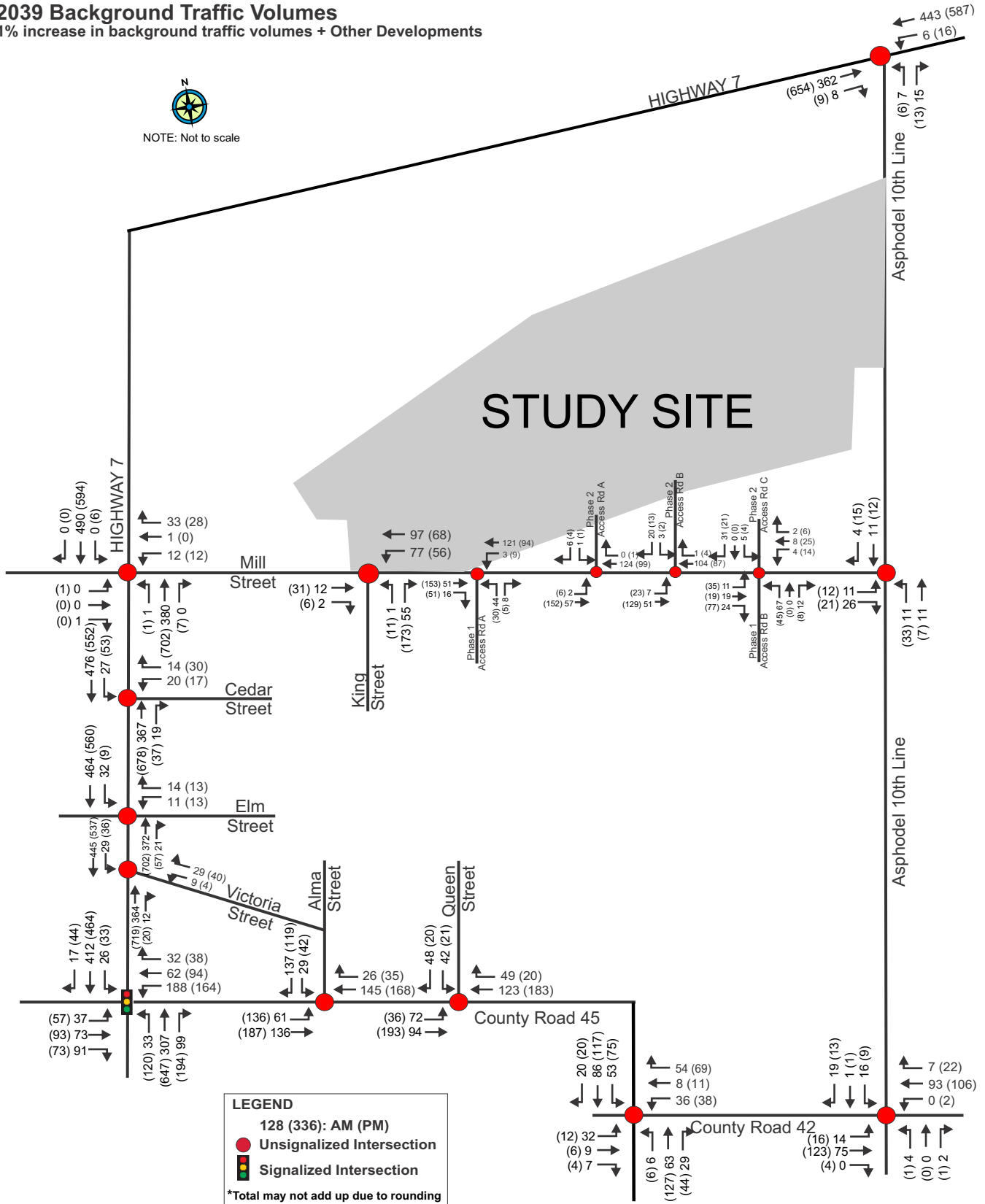
Exhibit 2.10: 2039 Total Background Traffic Volumes

2039 Background Traffic Volumes

1% increase in background traffic volumes + Other Developments



NOTE: Not to scale



**TRAFFIC GENERATION BY PROPOSED
DEVELOPMENT AND TOTAL TRAFFIC
CONDITIONS**

Exhibit 3.1A: Site Traffic AM, PM Peak Hour Distribution and Volumes

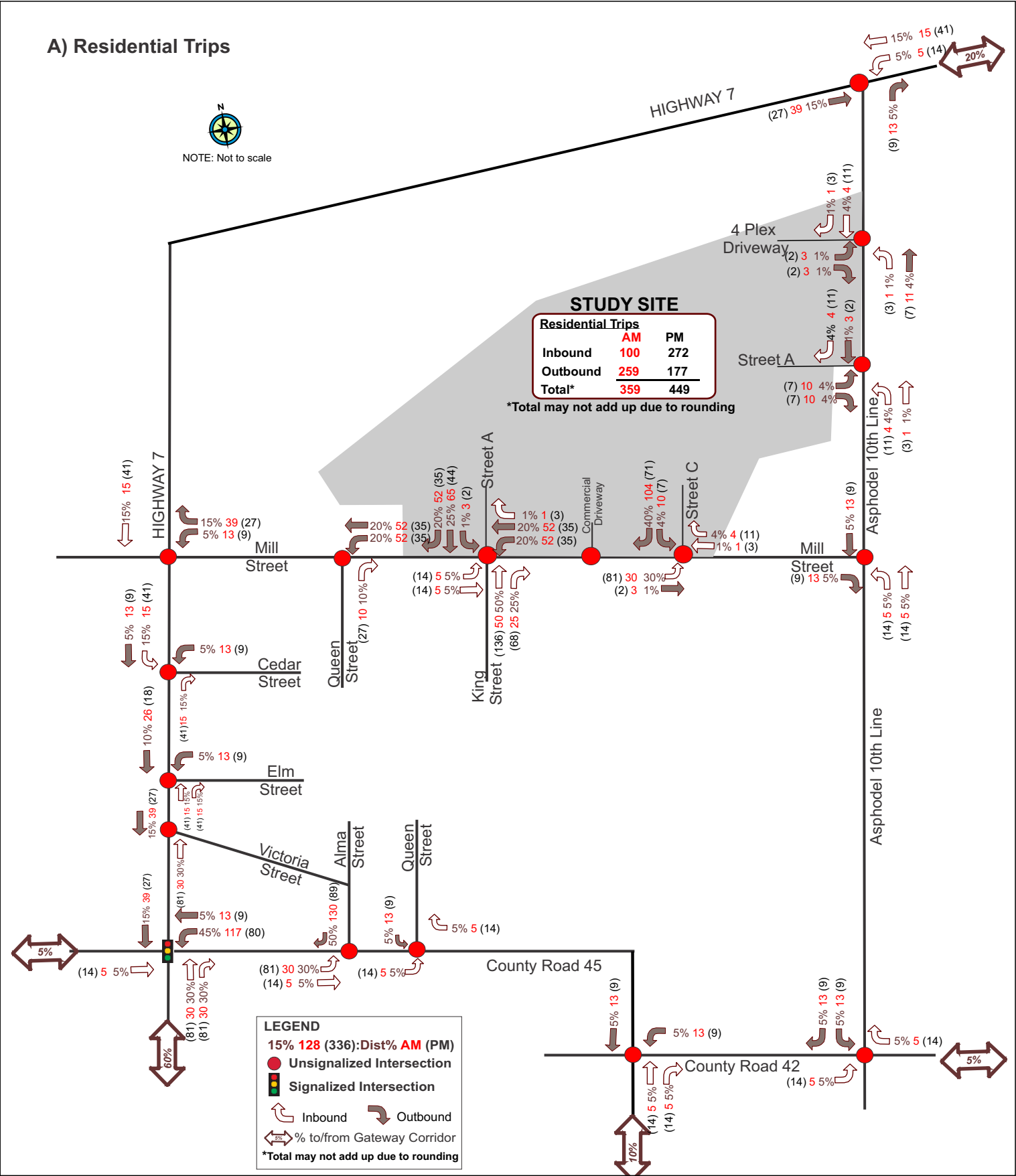


Exhibit 3.1B: Site Traffic AM, PM Peak Hour Distribution and Volumes

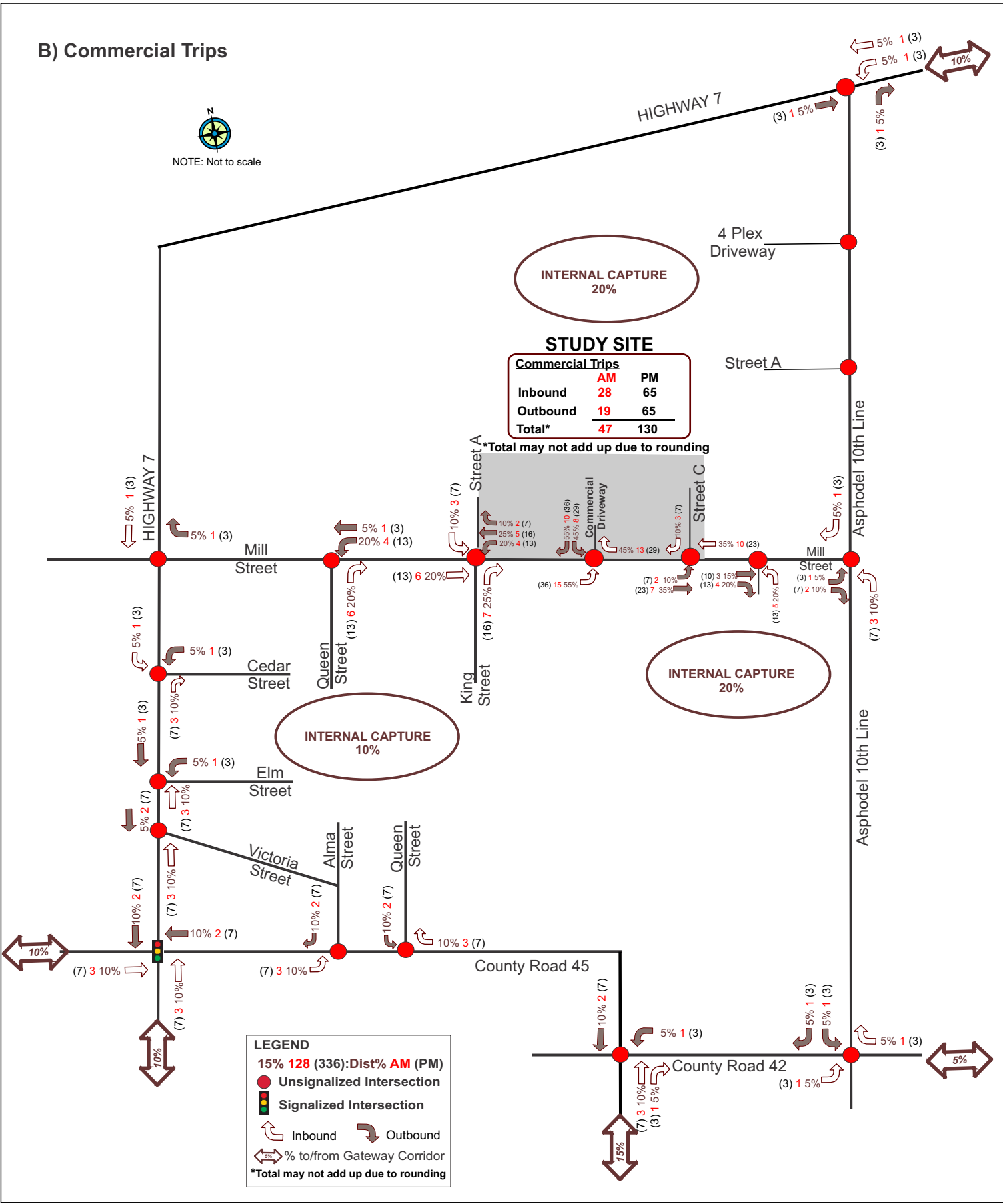


Exhibit 3.1C: Site Total Traffic Volumes

C) Residential+Commercial Trips

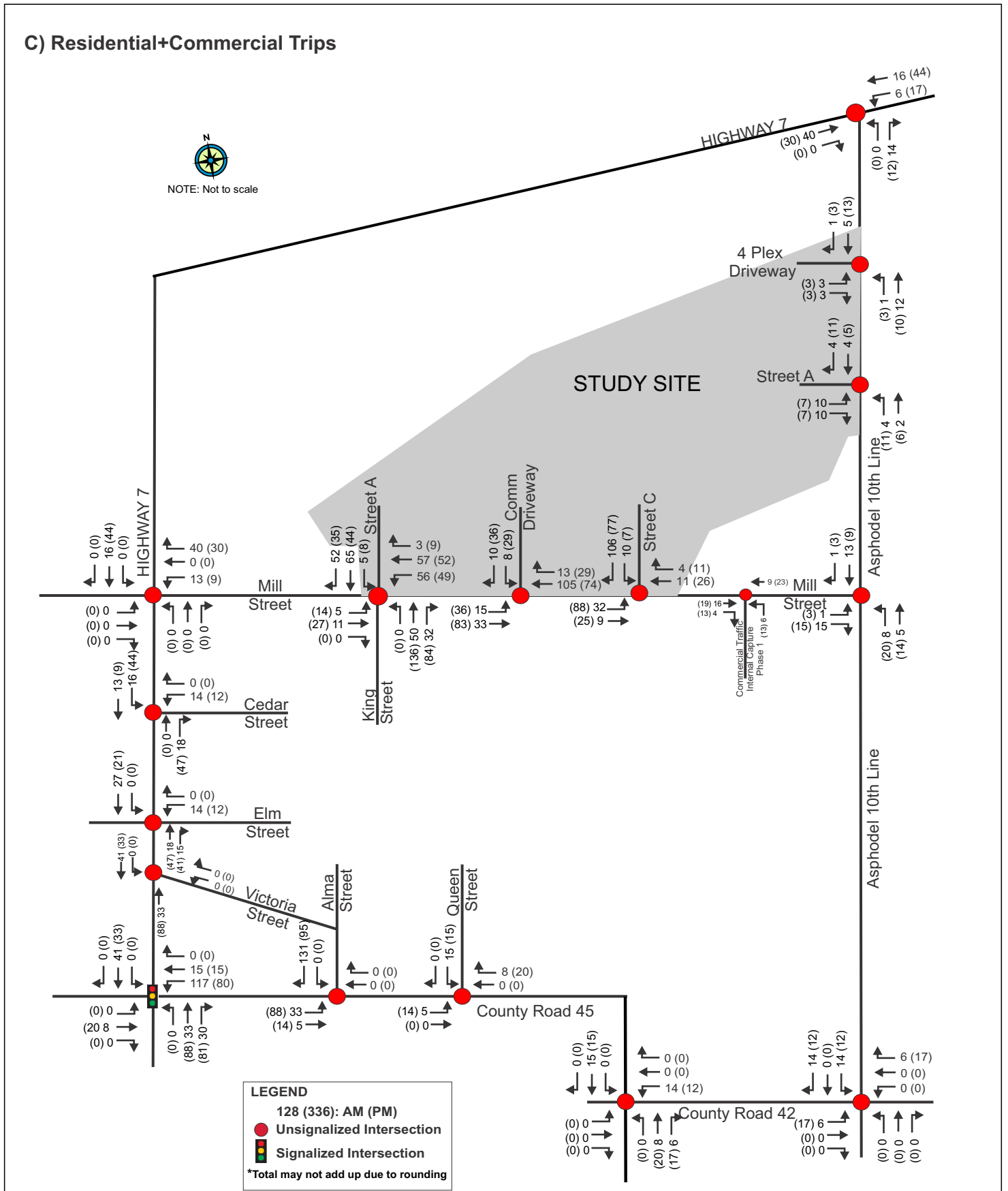


Exhibit 3.2: 2029 Total Traffic Volumes (External)

2029 Total Traffic Volumes

1% increase in background traffic volumes + Other Developments+Site Traffic



NOTE: Not to scale

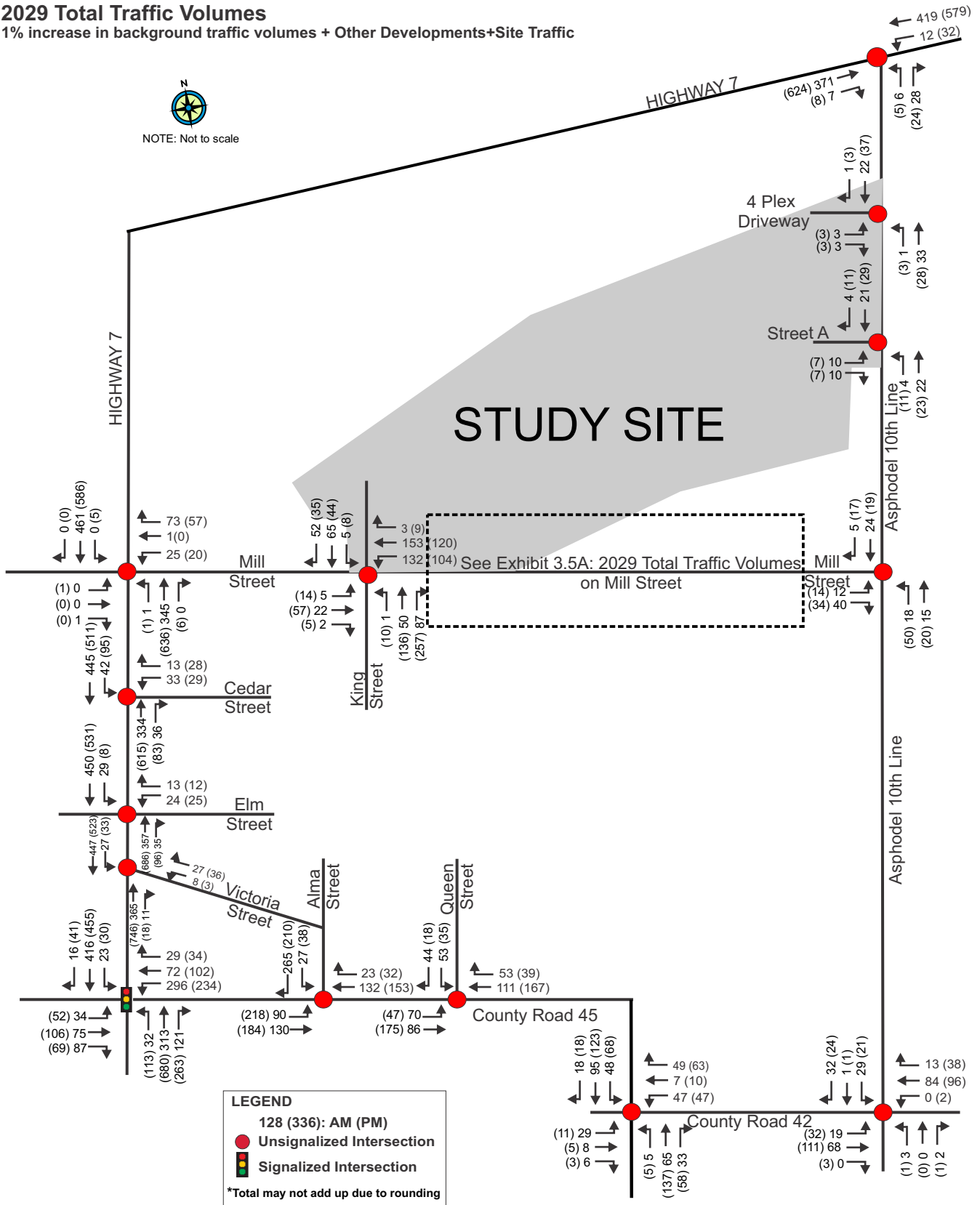


Exhibit 3.3: 2034 Total Traffic Volumes (External)

2034 Total Traffic Volumes

1% increase in background traffic volumes + Other Developments+Site Traffic



NOTE: Not to scale

STUDY SITE

See Exhibit 3.5B: 2034 Total Traffic Volumes on Mill Street

LEGEND

128 (336): AM (PM)

● Unsignalized Intersection

◫ Signalized Intersection

*Total may not add up due to rounding

Exhibit 3.4: 2039 Total Traffic Volumes (External)

2039 Total Traffic Volumes

1% increase in background traffic volumes + Other Developments+Site Traffic

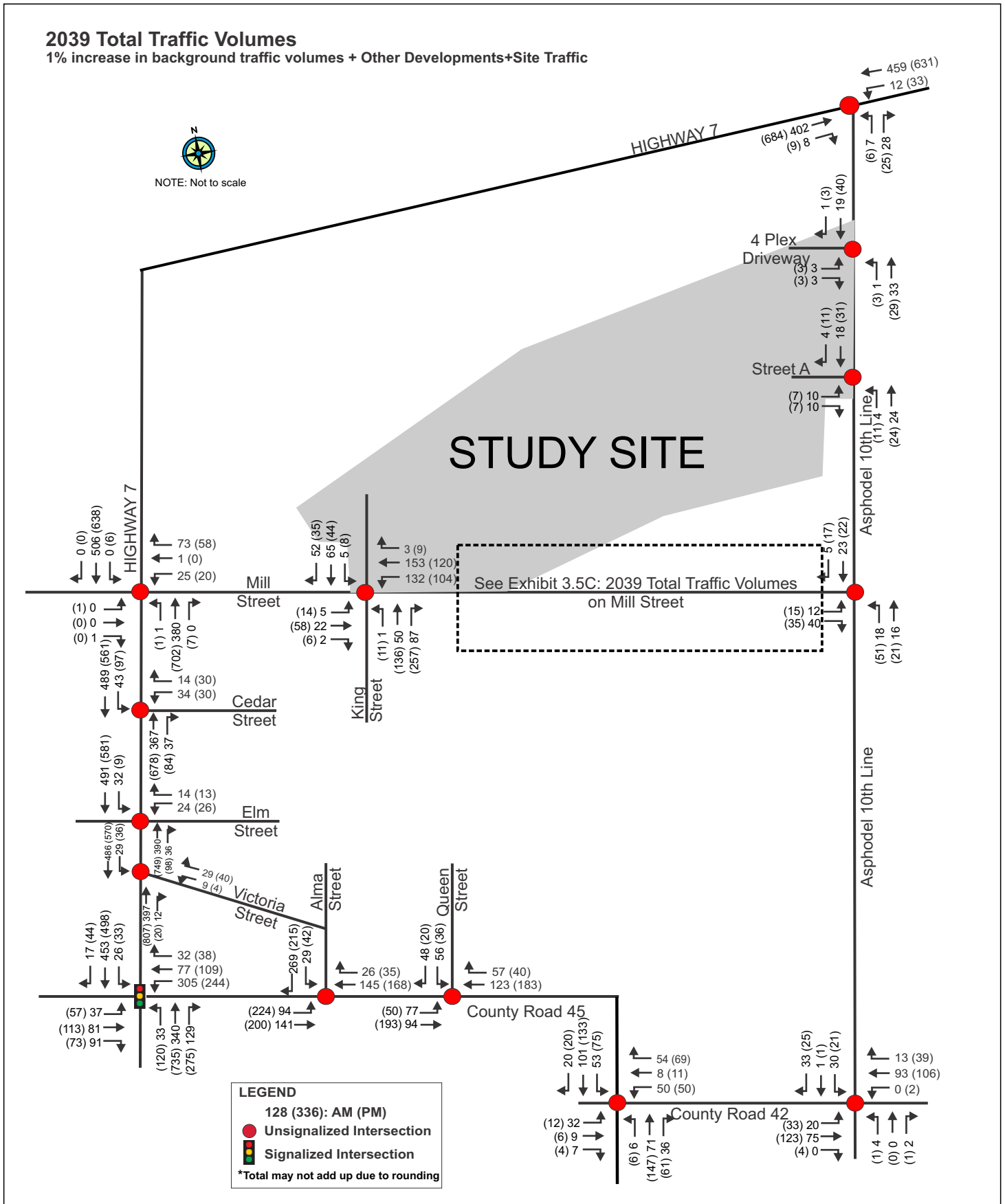
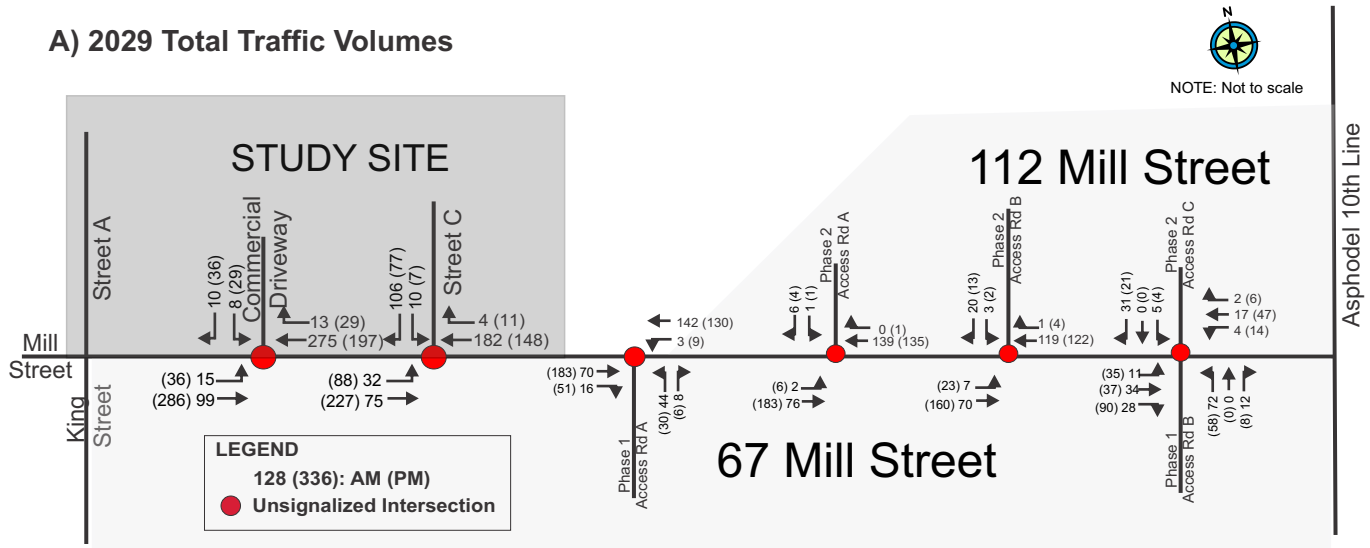
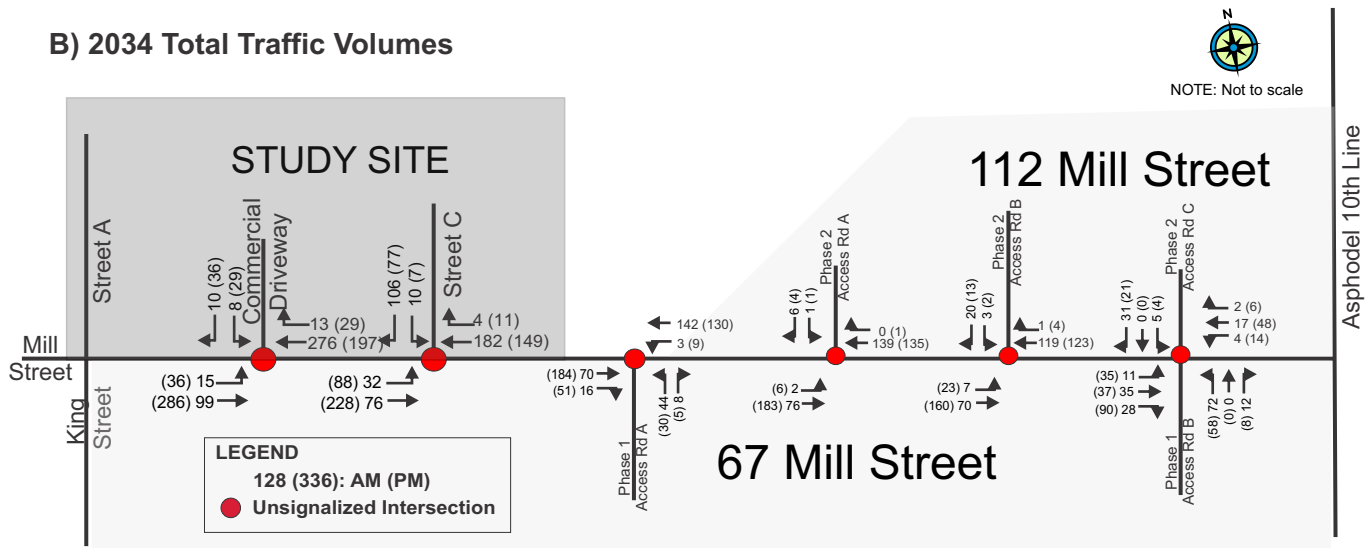


Exhibit 3.5: Total Traffic Volumes on Mill Street

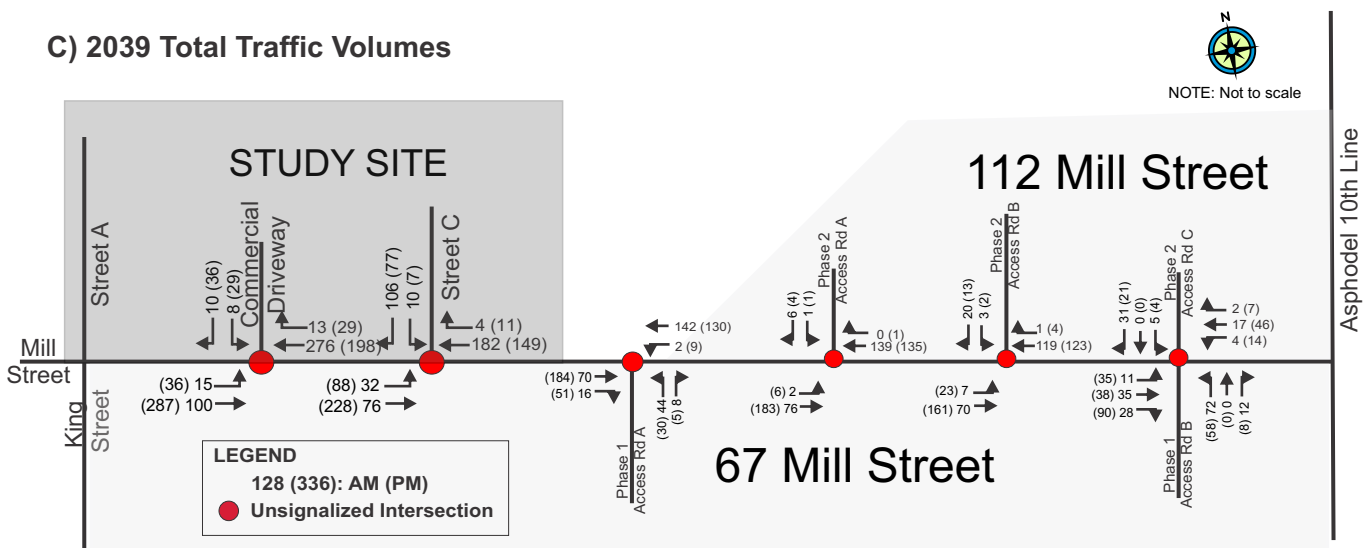
A) 2029 Total Traffic Volumes



B) 2034 Total Traffic Volumes



C) 2039 Total Traffic Volumes



APPENDIX C
LOS SUMMARY TABLES
TRIP GENERATION TABLES

Background Development Traffic

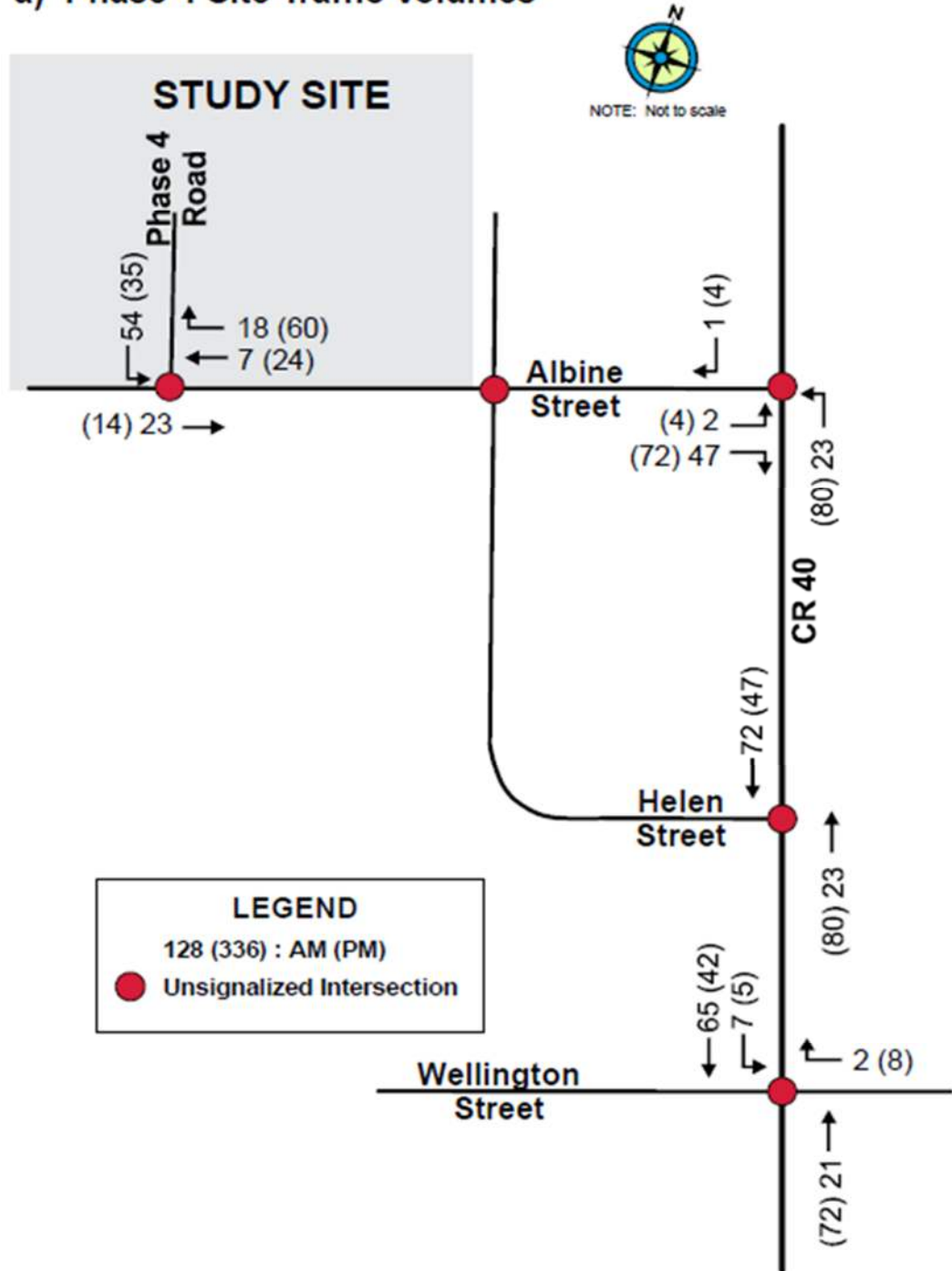
Trip Generation-67 Mill St. and 112 Mill St.

LAND USE	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
	Trip Generation Rate	Vehicle Trips			Trip Generation Rate	Vehicle Trips		
		Total	In	Out		Total	In	Out
112 Mill Street								
Single Detached Dwelling (ITE LU210)	<u>Trips Per Dwelling Units</u>	85	26%	74%	<u>Trips Per Dwelling Units</u>	113	63%	37%
115 Units	$\text{Ln}(T)=0.91\text{Ln}(x)+0.12$		22	63	$\text{Ln}(T)=0.94\text{Ln}(x)+0.27$		71	42
Single Family Attached Dwelling (ITE LU215)	<u>Trips Per Dwelling Units</u>	6	31%	69%	<u>Trips Per Dwelling Units</u>	7	57%	43%
12 Units	$(T)=0.48(x)$		2	4	$(T)=0.57(x)$		4	3
67 Mill Street								
Single Detached Dwelling (ITE LU210)	<u>Trips Per Dwelling Units</u>	163	26%	74%	<u>Trips Per Dwelling Units</u>	224	63%	37%
237 Units	$\text{Ln}(T)=0.91\text{Ln}(x)+0.12$		42	121	$\text{Ln}(T)=0.94\text{Ln}(x)+0.27$		141	83
Single Family Attached Dwelling (ITE LU215)	<u>Trips Per Dwelling Units</u>	14	31%	69%	<u>Trips Per Dwelling Units</u>	17	57%	43%
29 Units	$(T)=0.48(x)$		4	10	$(T)=0.57(x)$		10	6
TOTAL Trent Meadows (393 Units)		268	71	197		360	227	133

Note: The trip generation calculations were updated as part of this analysis to apply appropriate ITE Land Use Codes.

Site Traffic Volumes-Norwood Park

a) Phase 4 Site Traffic Volumes



Proposed Development Traffic

Revised Table 3.1: Trip Generation Calculation-Upper Mill Pond

LAND USE	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
	Trip Generation Rate	Vehicle Trips			Trip Generation Rate	Vehicle Trips		
		Total	In	Out		Total	In	Out
Single Detached Dwelling (ITE LU210)	<u>Trips Per Dwelling Units</u>	137	26%	74%	<u>Trips Per Dwelling Units</u>	187	63%	37%
196 Units	$\text{Ln}(T)=0.91\text{Ln}(x)+0.12$		36	102	$\text{Ln}(T)=0.94\text{Ln}(x)+0.27$		118	69
Single Family Attached Dwelling (ITE LU215)	<u>Trips Per Dwelling Units</u>	161	31%	69%	<u>Trips Per Dwelling Units</u>	188	57%	43%
320 Units	$(T)=0.52(x)-5.7$		50	111	$T=0.6(X)-3.93$		107	81
Multi-Family Dwelling (ITE LU220)	<u>Trips Per Dwelling Units</u>	61	24%	76%	<u>Trips Per Dwelling Units</u>	74	63%	37%
124 Units	$T=0.31(X)+22.85$		15	47	$T=0.43(X)+20.55$		47	27
Strip Retail Plaza(<40k) (ITE LU822)	<u>Trips Per 1000sq.ft GFA</u>	47	60%	40%	<u>Trips Per 1000sq.ft GFA</u>	131	50%	50%
19,827 sq.ft. GFA	$(T) =2.36(x)$		28	19	$(T) =6.59(x)$		65	65
Total Trips Upper Mill Pond		406	128	278		580	337	243

Note: Total may not add up due to rounding

Summary of Intersection Capacity Analysis- LOS Tables

**Revised Table 2.1- Intersection Capacity Analysis:2023 Existing Conditions-
CR45/Alma Street**

Intersection	2023 Existing Conditions							
	AM Peak				PM Peak			
County Road 45 & Alma Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
WB (Alma Street) - LR	A	10.0	2.1	0.08	B	10.8	3.4	0.12
NB (County Road 45) - TR	-	0.0	0.0	0.08	-	0.0	0.0	0.09
SB (County Road 45) - LT	A	2.0	0.6	0.03	A	2.4	1.1	0.04

Revised Table 4.1- Intersection Capacity Analysis: Background Traffic Conditions

	Intersection	2029 Background Conditions								2034 Background Conditions								2039 Background Conditions							
		AM Peak				PM Peak				AM Peak				PM Peak				AM Peak				PM Peak			
Highway 7 Corridor Under WFO Jurisdiction	Highway 7 & County Road 45 - Signalized	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
	EB (Highway 7) - L	B	16.2	10.9	0.13	C	20.1	36.5	0.38	B	16.7	11.2	0.14	C	21.7	38.4	0.42	B	17.4	11.3	0.15	C	24.2	42.1	0.47
	EB (Highway 7) - TR	C	20.1	103.7	0.55	D	46.2	#306.5	0.96	C	21.1	110.9	0.58	E	57.2	#325.6	1.00	C	22.6	118.6	0.61	E	72.5	#346.6	1.06
	WB (Highway 7) - L	B	15.4	7.8	0.09	C	27.5	13.0	0.36	B	15.8	8.3	0.11	D	40.7	15.8	0.48	B	16.3	8.2	0.11	F	85.6	#24.8	0.73
	WB (Highway 7) - TR	C	21.6	118.7	0.58	C	22.0	132.5	0.62	C	22.7	127.0	0.62	C	23.4	141.7	0.66	C	24.3	135.0	0.65	C	25.2	152.0	0.69
	NB (County Road 45) - L	C	33.3	49.8	0.62	C	29.8	43.7	0.51	C	34.1	51.3	0.64	C	30.1	45.1	0.52	C	34.2	52.4	0.64	C	30.2	46.1	0.53
	NB (County Road 45) - TR	C	20.9	21.1	0.22	C	24.8	29.6	0.29	C	21.2	21.7	0.23	C	25.0	30.9	0.30	C	21.1	22.6	0.23	C	25.1	32.4	0.31
	SB (County Road 40) - LTR	E	58.9	56.6	0.84	E	57.1	74.8	0.80	E	60.1	58.5	0.85	E	58.5	77.9	0.82	E	61.4	61.4	0.86	E	60.0	82.0	0.83
	Intersection Average	C	28.8			D	36.5			C	29.7			D	41.8			C	30.8			D	49.7		
	Highway 7 & Victoria Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
	WB (Victoria Street) - LR	B	12.4	1.9	0.07	C	15.1	2.8	0.11	B	12.9	2.1	0.08	C	16.2	3.2	0.12	B	13.2	2.3	0.09	C	19.1	4.3	0.16
	NB (Highway 7) - TR	-	0.0	0.0	0.23	-	0.0	0.0	0.45	-	0.0	0.0	0.24	-	0.0	0.0	0.47	-	0.0	0.0	0.25	-	0.0	0.0	0.49
	SB (Highway 7) - LT	A	0.8	0.6	0.02	A	1.2	1.1	0.05	A	0.8	0.6	0.03	A	1.3	1.3	0.05	A	0.8	0.7	0.03	A	1.5	1.4	0.06
	Highway 7 & Elm Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
	EB (Private Driveway) - LTR	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00
	WB (Elm Street) - LTR	C	15.3	1.7	0.07	D	33.4	4.8	0.17	C	15.9	1.8	0.07	E	43.0	6.4	0.22	C	16.7	2.1	0.08	F	53.1	8.2	0.27
	NB (Highway 7) - LTR	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00
	SB (Highway 7) - L	A	8.2	0.7	0.03	A	9.8	0.3	0.01	A	8.3	0.7	0.03	B	10.0	0.3	0.01	A	8.4	0.8	0.03	B	10.4	0.4	0.01
	SB (Highway 7) - TR	-	0.0	0.0	0.27	-	0.0	0.0	0.33	-	0.0	0.0	0.28	-	0.0	0.0	0.35	-	0.0	0.0	0.30	-	0.0	0.0	0.36
	Highway 7 & Cedar Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
	WB (Cedar Street) - LR	B	15.0	2.3	0.09	D	26.7	6.5	0.22	C	15.7	2.5	0.10	D	32.0	8.5	0.27	C	16.2	2.5	0.10	E	39.1	10.6	0.33
	NB (Highway 7) - TR	-	0.0	0.0	0.23	-	0.0	0.0	0.43	-	0.0	0.0	0.24	-	0.0	0.0	0.45	-	0.0	0.0	0.25	-	0.0	0.0	0.47
	SB (Highway 7) - L	A	8.1	0.5	0.02	A	9.8	1.8	0.07	A	8.2	0.6	0.02	B	10.0	1.9	0.07	A	8.3	0.6	0.02	B	10.3	2.1	0.08
	SB (Highway 7) - T	A	0.0	0.0	0.26	A	1.3	1.8	0.07	-	0.0	0.0	0.28	A	1.4	1.9	0.07	-	0.0	0.0	0.29	A	1.6	2.1	0.08
	Highway 7 & Mill St.	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
	WB (Mill Street) - LR	B	12.5	2.4	0.09	C	18.9	3.7	0.14	B	12.8	2.5	0.10	C	20.0	4.1	0.15	B	13.1	2.6	0.10	C	21.9	4.7	0.17
	NB (Highway 7) - TR	-	0.0	0.0	0.22	-	0.0	0.0	0.42	-	0.0	0.0	0.23	-	0.0	0.0	0.45	-	0.0	0.0	0.25	-	0.0	0.0	0.47
	SB (Highway 7) - LT	-	0.0	0.0	0.00	A	0.2	0.1	0.01	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00
	Highway 7 & 10th Line	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
	EB (Highway 7) - TR	-	0.0	0.0	0.20	-	0.0	0.0	0.38	-	0.0	0.0	0.22	-	0.0	0.0	0.40	-	0.0	0.0	0.23	-	0.0	0.0	0.42
	WB (Highway 7) - LT	A	0.2	0.1	0.01	A	0.5	0.5	0.02	A	0.2	0.1	0.01	A	0.5	0.5	0.02	A	0.2	0.1	0.01	A	0.5	0.5	0.02
	NB (10th Line) - LR	B	12.0	1.1	0.04	C	17.5	2.8	0.11	B	12.5	1.2	0.05	C	19.2	3.4	0.12	B	12.7	1.3	0.05	C	20.1	3.8	0.14
County Road 45 & County Road 42	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	
EB (Birch Street) - LTR	A	8.0	-	0.06	A	8.1	-	0.03	A	8.0	-	0.07	A	8.2	-	0.03	A	8.1	-	0.07	A	8.3	-	0.03	
WB (County Road 42) - LTR	A	7.9	-	0.12	A	8.3	-	0.15	A	8.0	-	0.12	A	8.5	-	0.16	A	8.0	-	0.13	A	8.6	-	0.17	
NB (County Road 45) - LTR	A	7.8	-	0.12	A	8.5	-	0.21	A	7.9	-	0.12	A	8.7	-	0.23	A	8.0	-	0.13	A	8.8	-	0.24	
SB (County Road 45) - LTR	A	8.4	-	0.19	A	9.1	-	0.26	A	8.5	-	0.20	A	9.2	-	0.28	A	8.6	-	0.21	A	9.4	-	0.29	
County Road 45 & Alma Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	
WB (Alma Street) - LR	B	10.5	6.4	0.21	B	12.3	7.9	0.25	B	10.6	6.6	0.22	B	12.6	8.5	0.26	B	10.8	6.9	0.23	B	13.0	9.2	0.28	
NB (County Road 45) - T	-	0.0	0.0	0.08	-	0.0	0.0	0.12	-	0.0	0.0	0.09	-	0.0	0.0	0.12	-	0.0	0.0	0.09	-	0.0	0.0	0.13	
SB (County Road 45) - LT	A	2.6	1.1	0.04	A	3.9	2.7	0.10	A	2.6	1.1	0.04	A	3.9	2.8	0.10	A	2.6	1.2	0.05	A	3.9	2.8	0.11	
County Road 45 & Queen St.	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	
WB (Queen Street) - LR	B	10.7	3.4	0.12	B	10.8	1.6	0.06	B	10.8	3.6	0.13	B	10.9	1.7	0.07	B	11.0	3.9	0.14	B	11.1	1.8	0.07	
NB (County Road 45) - TR	-	0.0	0.0	0.10	-	0.0	0.0	0.12	-	0.0	0.0	0.10	-	0.0	0.0	0.12	-	0.0	0.0	0.11	-	0.0	0.0	0.13	
SB (County Road 45) - LT	A	3.6	1.3	0.05	A	1.5	0.7	0.03	A	3.6	1.3	0.05	A	1.4	0.7	0.03	A	3.6	1.4	0.06	A	1.4	0.7	0.03	
County Road 42 & 10th Line	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	
EB (County Road 42) - LTR	A	1.2	0.2	0.01	A	1.0	0.3	0.01	A	1.3	0.2	0.01	A	1.0	0.3	0.01	A	1.2	0.2	0.01	A	0.9	0.3	0.01	
WB (County Road 42) - LTR	-	0.0	0.0	0.00	A	0.1	0.0	0.00	-	0.0	0.0	0.00	A	0.1	0.0	0.00	-	0.0	0.0	0.00	A	0.1	0.0	0.00	
NB (10th Line) - LTR	A	9.5	0.1	0.01	A	9.7	0.1	0.00	A	9.6	0.2	0.01	A	9.8	0.1	0.00	A	9.7	0.2	0.01	A	9.9	0.1	0.00	
SB (10th Line) - LTR	A	9.4	1.0	0.04	A	9.7	0.8	0.03	A	9.5	1.1	0.05	A	9.8	0.8	0.03	A	9.5	1.2	0.05	A	9.8	0.8	0.03	
Mill Street & 10th Line	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	
EB (Mill Street) - LR	A	8.6	0.9	0.04	A	8.8	0.8	0.03	A	8.6	0.9	0.04	A	8.8	0.8	0.03	A	8.6	1.0	0.04	A	8.8	0.8	0.03	
NB (10th Line) - LR	A	3.7	0.2	0.01	A	6.1	0.5	0.02	A	3.7	0.2	0.01	A	6.0	0.5	0.02	A	3.7	0.2	0.01	A	6.0	0.5	0.02	
SB (10th Line) - TR	-	0.0	0.0	0.01	-	0.0	0.0	0.02	-	0.0	0.0	0.01	-	0.0	0.0	0.02	-	0.0	0.0	0.01	-	0.0	0.0	0.02	
Mill Street & King Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	
EB (Mill Street) - TR	-	0.0	0.0	0.01	-	0.0	0.0	0.02	-	0.0	0.0	0.01	-	0.0	0.0	0.02	-	0.0	0.0	0.01	-	0.0	0.0	0.02	
WB (Mill Street) - LT	A	3.5	1.3	0.05	A	3.5	1.0	0.04	A	3.5	1.3	0.05	A	3.5	1.0	0.04	A	3.5	1.3	0.05	A	3.5	1.0	0.04	
NB (King Street) - LR	A	8.6	1.5	0.06	A	9.4																			

Revised Table 4.3- Intersection Capacity Analysis: Total Traffic Condition

Intersection	2029 Total Conditions								2034 Total Conditions								2039 Total Conditions											
	AM Peak				PM Peak*				AM Peak				PM Peak*				AM Peak				PM Peak*							
Highway 7 & County Road 45 - Signalized*	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB (Highway 7) - L	B	13.2	10.1	0.10	C	20.2	36.3	0.37	B	13.6	10.5	0.11	C	21.6	38.2	0.41	B	14.1	10.8	0.12	C	23.8	41.8	0.45				
EB (Highway 7) - TR	B	18.3	108.7	0.57	F	107.7	#400.5	1.15	B	19.3	116.8	0.60	F	125.6	#419.1	1.20	C	20.5	126.2	0.63	F	147.3	#439.9	1.25				
WB (Highway 7) - L	B	12.8	7.7	0.07	D	53.0	#24.7	0.52	B	13.2	8.4	0.08	E	55.4	#25.2	0.54	B	13.6	8.6	0.09	E	60.1	#26.7	0.57				
WB (Highway 7) - TR	B	17.6	104.7	0.52	C	22.6	142.1	0.63	B	18.5	113.3	0.55	C	23.9	151.6	0.66	B	19.5	121.9	0.58	C	25.6	163.2	0.70				
NB (County Road 45) - L	F	80.8	#112.7	0.99	D	41.4	65.0	0.75	F	83.8	#115.3	1.01	D	42.7	66.7	0.76	F	86.6	#118.5	1.02	D	43.8	#69.5	0.78				
NB (County Road 45) - TR	C	22.2	27.4	0.21	C	23.9	36.7	0.26	C	22.4	28.7	0.22	C	24.0	38.0	0.27	C	22.2	29.3	0.22	C	24.2	39.6	0.28				
SB (County Road 40) - LTR	D	52.7	63.8	0.77	E	57.9	78.9	0.81	D	53.1	65.7	0.77	E	58.8	81.6	0.82	D	53.6	68.5	0.78	E	60.3	85.1	0.83				
Intersection Average*	C	34.8			E	65.5			D	35.7			E	73.9			D	36.8			F	84.0						
Highway 7 & Victoria Street*	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
WB (Victoria Street) - LR	B	12.7	2.0	0.08	C	17.5	3.5	0.13	B	13.2	2.2	0.08	C	19.3	4.1	0.15	B	13.5	2.4	0.09	C	23.6	5.7	0.20				
NB (Highway 7) - TR	-	0.0	0.0	0.24	-	0.0	0.0	0.49	-	0.0	0.0	0.25	-	0.0	0.0	0.51	-	0.0	0.0	0.26	-	0.0	0.0	0.53				
SB (Highway 7) - LT	A	0.7	0.6	0.03	A	1.4	1.3	0.05	A	0.8	0.7	0.03	A	1.5	1.4	0.06	A	0.8	0.7	0.03	A	1.7	1.6	0.06				
Highway 7 & Elm Street*	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
EB (Private Driveway) - LTR	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00				
WB (Elm Street) - LTR	C	18.9	3.7	0.13	F	66.4	13.7	0.41	C	19.9	3.9	0.14	F	89.8	17.0	0.50	C	20.9	4.3	0.15	F	131.2	22.3	0.65				
NB (Highway 7) - LTR	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00				
SB (Highway 7) - L	A	8.3	0.7	0.03	B	10.3	0.3	0.01	A	8.3	0.7	0.03	B	10.6	0.4	0.02	A	8.4	0.8	0.03	B	11.0	0.4	0.02				
SB (Highway 7) - TR	-	0.0	0.0	0.29	-	0.0	0.0	0.34	-	0.0	0.0	0.30	-	0.0	0.0	0.35	-	0.0	0.0	0.31	-	0.0	0.0	0.37				
Highway 7 & Cedar Street*	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
WB (Cedar Street) - LR	C	17.9	4.3	0.15	F	58.6	18.1	0.49	C	18.9	4.7	0.16	F	78.8	23.1	0.60	C	19.8	5.0	0.18	F	118.5	30.1	0.75				
NB (Highway 7) - TR	-	0.0	0.0	0.24	-	0.0	0.0	0.45	-	0.0	0.0	0.25	-	0.0	0.0	0.47	-	0.0	0.0	0.26	-	0.0	0.0	0.49				
SB (Highway 7) - L	A	8.2	0.7	0.04	B	10.3	3.6	0.13	A	8.3	1.0	0.04	B	10.6	3.9	0.14	A	8.4	1.0	0.04	B	11.0	4.2	0.15				
SB (Highway 7) - T	-	0.0	0.0	0.28	A	2.5	3.6	0.13	-	0.0	0.0	0.30	-	0.0	0.0	0.34	-	0.0	0.0	0.31	-	0.0	0.0	0.37				
Highway 7 & Mill Street*	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
WB (Mill Street) - LR	B	13.5	5.9	0.20	C	20.8	8.5	0.27	B	13.9	6.2	0.21	C	22.3	9.4	0.29	B	14.4	6.5	0.22	C	24.2	10.4	0.31				
NB (Highway 7) - TR	-	0.0	0.0	0.22	-	0.0	0.0	0.41	-	0.0	0.0	0.23	-	0.0	0.0	0.43	-	0.0	0.0	0.24	-	0.0	0.0	0.45				
SB (Highway 7) - LT	-	0.0	0.0	0.00	A	0.1	0.1	0.01	-	0.0	0.0	0.00	A	0.2	0.2	0.01	-	0.0	0.0	0.00	A	0.2	0.2	0.01				
Highway 7 & 10th Line	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
EB (Highway 7) - TR	-	0.0	0.0	0.24	-	0.0	0.0	0.40	-	0.0	0.0	0.25	-	0.0	0.0	0.42	-	0.0	0.0	0.26	-	0.0	0.0	0.44				
WB (Highway 7) - LT	A	0.3	0.3	0.01	A	1.0	1.0	0.04	A	0.3	0.3	0.01	A	1.1	1.0	0.04	A	0.3	0.3	0.01	A	1.1	1.1	0.04				
NB (10th Line) - LR	B	12.2	1.8	0.07	C	16.6	2.4	0.09	B	12.7	1.9	0.07	C	18.6	3.0	0.11	B	12.9	2.0	0.08	C	19.5	3.2	0.12				
County Road 45 & County Road 42	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
EB (Birch Street) - LTR	A	8.1	-	0.06	A	8.3	-	0.03	A	8.2	-	0.07	A	8.4	-	0.03	A	8.2	-	0.07	A	8.5	-	0.04				
WB (County Road 42) - LTR	A	8.2	-	0.14	A	8.7	-	0.17	A	8.3	-	0.14	A	8.8	-	0.18	A	8.3	-	0.15	A	9.0	-	0.19				
NB (County Road 45) - LTR	A	8.0	-	0.13	A	9.0	-	0.27	A	8.1	-	0.14	A	9.2	-	0.28	A	8.2	-	0.15	A	9.3	-	0.29				
SB (County Road 45) - LTR	A	8.6	-	0.22	A	9.4	-	0.29	A	8.8	-	0.23	A	9.6	-	0.30	A	8.9	-	0.24	A	9.8	-	0.32				
County Road 45 & Alma Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
WB (Alma Street) - LR	B	11.8	14.1	0.38	B	14.1	15.8	0.41	B	12.0	14.6	0.38	B	14.6	16.9	0.42	B	12.2	15.2	0.40	C	15.4	18.6	0.45				
NB (County Road 45) - TR	-	0.0	0.0	0.08	-	0.0	0.0	0.10	-	0.0	0.0	0.09	-	0.0	0.0	0.10	-	0.0	0.0	0.09	-	0.0	0.0	0.11				
SB (County Road 45) - LT	A	3.5	1.8	0.07	A	5.1	4.8	0.17	A	3.5	1.8	0.07	A	5.1	4.9	0.17	A	3.5	1.9	0.07	A	5.1	5.1	0.17				
County Road 45 & Queen St.	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
WB (Queen Street) - LR	B	11.2	4.3	0.15	B	11.7	2.6	0.10	B	11.4	4.6	0.16	B	11.9	2.7	0.10	B	11.6	4.9	0.17	B	12.1	2.9	0.11				
NB (County Road 45) - TR	-	0.0	0.0	0.11	-	0.0	0.0	0.13	-	0.0	0.0	0.11	-	0.0	0.0	0.14	-	0.0	0.0	0.12	-	0.0	0.0	0.14				
SB (County Road 45) - LT	A	3.7	1.4	0.05	A	1.9	0.9	0.04	A	3.7	1.4	0.05	A	1.9	1.0	0.04	A	3.8	1.6	0.06	A	1.9	1.0	0.04				
County Road 42 & 10th Line	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c				
EB (County Road 42) - LTR	A	1.7	0.3	0.01	A	1.8	0.6	0.02	A	1.8	0.4	0.01	A	1.8	0.6	0.03	A	1.7	0.4	0.01	A	1.7	0.6	0.03				
WB (County Road 42) - LTR	-	0.0	0.0	0.00	A	0.1	0.0	0.00	-	0.0	0.0	0.00	A	0.1	0.0	0.00	-	0.0	0.0	0.00	A	0.1	0.0	0.00				
NB (10th Line) - LTR	A	9.7	0.2	0.01	B	10.1	0.1	0.00	A	9.8	0.2	0.01	B	10.1	0.1	0.00	A	10.0	0.2	0.01	B	10.2	0.1	0.00				
SB (10th Line) - LTR	A	9.7	2.1	0.08	B	10.2	1.7	0.07	A	9.8	2.2	0.08	B	10.3	1.7	0.07	A	9.8	2.3	0.09	B	10.3	1.8	0.07				
Mill Street & 10th Line	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay						

APPENDIX D

SYNCHRO REPORTS

EXISTING CONDITIONS

Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2023 Existing Traffic Condition
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	33	121	22	34	105
Future Volume (Veh/h)	25	33	121	22	34	105
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	36	132	24	37	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	320	132			132	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320	132			132	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	96			97	
cM capacity (veh/h)	656	917			1453	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	63	132	24	151		
Volume Left	27	0	0	37		
Volume Right	36	0	24	0		
cSH	784	1700	1700	1453		
Volume to Capacity	0.08	0.08	0.01	0.03		
Queue Length 95th (m)	2.1	0.0	0.0	0.6		
Control Delay (s)	10.0	0.0	0.0	2.0		
Lane LOS	A			A		
Approach Delay (s)	10.0	0.0		2.0		
Approach LOS	A					
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			27.2%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2023 Existing Traffic Condition
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	45	134	30	58	144
Future Volume (Veh/h)	36	45	134	30	58	144
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	49	146	33	63	157
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	429	146			146	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	429	146			146	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	95			96	
cM capacity (veh/h)	557	901			1436	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	88	146	33	220		
Volume Left	39	0	0	63		
Volume Right	49	0	33	0		
cSH	708	1700	1700	1436		
Volume to Capacity	0.12	0.09	0.02	0.04		
Queue Length 95th (m)	3.4	0.0	0.0	1.1		
Control Delay (s)	10.8	0.0	0.0	2.4		
Lane LOS	B			A		
Approach Delay (s)	10.8	0.0		2.4		
Approach LOS	B					
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			32.6%		ICU Level of Service	A
Analysis Period (min)			15			

BACKGROUND TRAFFIC CONDITIONS

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Bkgd Traffic Volumes
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	280	91	23	376	16	179	58	29	34	67	87
Future Volume (vph)	32	280	91	23	376	16	179	58	29	34	67	87
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.98	1.00		0.98	0.98			0.97	
Frt		0.958			0.980			0.950			0.943	
Flt Protected	0.950			0.950			0.950				0.989	
Satd. Flow (prot)	1397	1425	0	1458	1544	0	1599	1615	0	0	1541	0
Flt Permitted	0.380			0.429			0.393				0.893	
Satd. Flow (perm)	556	1425	0	647	1544	0	651	1615	0	0	1384	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			9			25			30	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Peak Hour Factor	0.80	0.91	0.75	0.69	0.88	0.25	0.86	0.68	0.69	0.58	0.67	0.75
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Adj. Flow (vph)	40	308	121	33	427	64	208	85	42	59	100	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	429	0	33	491	0	208	127	0	0	275	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Bkgd Traffic Volumes
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		41.7	38.3			24.4	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.38	0.35			0.22	
v/c Ratio	0.13	0.55		0.09	0.58		0.62	0.22			0.84	
Control Delay	16.2	20.1		15.4	21.6		33.3	20.9			58.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	16.2	20.1		15.4	21.6		33.3	20.9			58.9	
LOS	B	C		B	C		C	C			E	
Approach Delay		19.8			21.2			28.6			58.9	
Approach LOS		B			C			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 111

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 28.8

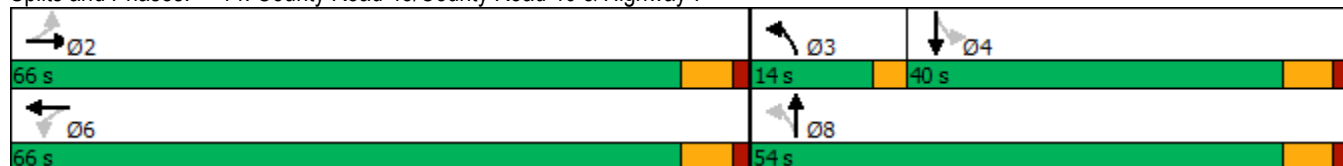
Intersection LOS: C

Intersection Capacity Utilization 69.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
 14: County Road 45/County Road 40 & Highway 7

2029 Future Bkgd Traffic Volumes
 AM Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	40	429	33	491	208	127	275
v/c Ratio	0.13	0.55	0.09	0.58	0.62	0.22	0.84
Control Delay	16.2	20.1	15.4	21.6	33.3	20.9	58.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	20.1	15.4	21.6	33.3	20.9	58.9
Queue Length 50th (m)	4.4	58.1	3.5	71.2	33.5	16.1	54.1
Queue Length 95th (m)	10.9	103.7	7.8	118.7	49.8	21.1	56.6
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	301	783	350	840	339	709	441
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.55	0.09	0.58	0.61	0.18	0.62
Intersection Summary							

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	280	91	23	376	16	179	58	29	34	67	87
Future Volume (vph)	32	280	91	23	376	16	179	58	29	34	67	87
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		0.99	1.00			1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1390	1425		1433	1545		1590	1626			1539	
Flt Permitted	0.38	1.00		0.43	1.00		0.39	1.00			0.89	
Satd. Flow (perm)	556	1425		647	1545		658	1626			1389	
Peak-hour factor, PHF	0.80	0.91	0.75	0.69	0.88	0.25	0.86	0.68	0.69	0.58	0.67	0.75
Adj. Flow (vph)	40	308	121	33	427	64	208	85	42	59	100	116
RTOR Reduction (vph)	0	11	0	0	4	0	0	16	0	0	23	0
Lane Group Flow (vph)	40	418	0	33	487	0	208	111	0	0	252	0
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		38.3	38.3			24.4	
Effective Green, g (s)	60.1	60.1		60.1	60.1		38.3	38.3			24.4	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.35	0.35			0.22	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	301	772		350	837		318	561			305	
v/s Ratio Prot		0.29			c0.32		c0.06	0.07				
v/s Ratio Perm	0.07			0.05			0.16				c0.18	
v/c Ratio	0.13	0.54		0.09	0.58		0.65	0.20			0.82	
Uniform Delay, d1	12.5	16.5		12.3	17.0		28.7	25.5			41.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.9	2.7		0.5	2.9		4.8	0.2			16.4	
Delay (s)	13.5	19.2		12.8	19.9		33.5	25.7			57.6	
Level of Service	B	B		B	B		C	C			E	
Approach Delay (s)		18.7			19.5			30.5			57.6	
Approach LOS		B			B			C			E	
Intersection Summary												
HCM 2000 Control Delay			28.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			110.9			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			69.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	33	345	0	0	445
Future Volume (Veh/h)	12	33	345	0	0	445
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	13	36	379	0	0	464
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	843	379			379	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	843	379			379	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	95			100	
cM capacity (veh/h)	337	672			1191	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	49	379	464			
Volume Left	13	0	0			
Volume Right	36	0	0			
cSH	532	1700	1191			
Volume to Capacity	0.09	0.22	0.00			
Queue Length 95th (m)	2.4	0.0	0.0			
Control Delay (s)	12.5	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.5	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		35.4%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	25	10	10	10	4
Future Volume (Veh/h)	11	25	10	10	10	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	27	11	11	11	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	46	13	15			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46	13	15			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	99			
cM capacity (veh/h)	957	1067	1603			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	39	22	15			
Volume Left	12	11	0			
Volume Right	27	0	4			
cSH	1031	1603	1700			
Volume to Capacity	0.04	0.01	0.01			
Queue Length 95th (m)	0.9	0.2	0.0			
Control Delay (s)	8.6	3.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.6	3.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			17.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
5: Highway 7 & Belmont Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	1	345	458	0
Future Volume (Veh/h)	0	1	1	345	458	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	0	1	1	379	477	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	858	477	477			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	858	477	477			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	330	592	1096			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	1	380	477			
Volume Left	0	1	0			
Volume Right	1	0	0			
cSH	592	1096	1700			
Volume to Capacity	0.00	0.00	0.28			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	11.1	0.0	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.1	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			36.2%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street & Mill Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	11	2	77	96	1	55
Future Volume (Veh/h)	11	2	77	96	1	55
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	2	84	104	1	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			14		285	13
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			14		285	13
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		100	94
cM capacity (veh/h)			1604		668	1067
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	14	188	61			
Volume Left	0	84	1			
Volume Right	2	0	60			
cSH	1700	1604	1057			
Volume to Capacity	0.01	0.05	0.06			
Queue Length 95th (m)	0.0	1.3	1.5			
Control Delay (s)	0.0	3.5	8.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.5	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization			26.1%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
8: 67 Mill St. Access Road A & Mill Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	50	16	3	127	44	8
Future Volume (Veh/h)	50	16	3	127	44	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	17	3	138	48	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			71		206	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			71		206	62
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1529		780	1002
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	71	141	57			
Volume Left	0	3	48			
Volume Right	17	0	9			
cSH	1700	1529	809			
Volume to Capacity	0.04	0.00	0.07			
Queue Length 95th (m)	0.0	0.0	1.8			
Control Delay (s)	0.0	0.2	9.8			
Lane LOS			A			
Approach Delay (s)	0.0	0.2	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			19.1%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	13	334	18	25	432
Future Volume (Veh/h)	19	13	334	18	25	432
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	21	14	367	20	26	450
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (m)			376			
pX, platoon unblocked						
vC, conflicting volume	879	377			387	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	377			387	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	98			98	
cM capacity (veh/h)	311	670			1171	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	35	387	26	450		
Volume Left	21	0	26	0		
Volume Right	14	20	0	0		
cSH	396	1700	1171	1700		
Volume to Capacity	0.09	0.23	0.02	0.26		
Queue Length 95th (m)	2.3	0.0	0.5	0.0		
Control Delay (s)	15.0	0.0	8.1	0.0		
Lane LOS	B		A			
Approach Delay (s)	15.0	0.0	0.4			
Approach LOS	B					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			34.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	10	0	13	0	339	20	29	423	0
Future Volume (Veh/h)	0	0	0	10	0	13	0	339	20	29	423	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	11	0	14	0	390	23	32	460	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)	188											
pX, platoon unblocked												
vC, conflicting volume	940	937	460	926	926	402	460	413				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	940	937	460	926	926	402	460	413				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	100	100	100	95	100	98	100	97				
cM capacity (veh/h)	234	257	601	244	261	649	1101	1146				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	25	413	32	460							
Volume Left	0	11	0	32	0							
Volume Right	0	14	23	0	0							
cSH	1700	375	1101	1146	1700							
Volume to Capacity	0.00	0.07	0.00	0.03	0.27							
Queue Length 95th (m)	0.0	1.7	0.0	0.7	0.0							
Control Delay (s)	0.0	15.3	0.0	8.2	0.0							
Lane LOS	A	C		A								
Approach Delay (s)	0.0	15.3	0.0	0.5								
Approach LOS	A	C										
Intersection Summary												
Average Delay	0.7											
Intersection Capacity Utilization	36.2%			ICU Level of Service					A			
Analysis Period (min)	15											

Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	27	134	132	23	57	125
Future Volume (Veh/h)	27	134	132	23	57	125
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	146	143	25	62	136
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	403	143			143	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	403	143			143	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	84			96	
cM capacity (veh/h)	577	905			1440	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	175	143	25	198		
Volume Left	29	0	0	62		
Volume Right	146	0	25	0		
cSH	827	1700	1700	1440		
Volume to Capacity	0.21	0.08	0.01	0.04		
Queue Length 95th (m)	6.4	0.0	0.0	1.1		
Control Delay (s)	10.5	0.0	0.0	2.6		
Lane LOS	B			A		
Approach Delay (s)	10.5	0.0		2.6		
Approach LOS	B					
Intersection Summary						
Average Delay			4.4			
Intersection Capacity Utilization			36.4%		ICU Level of Service	A
Analysis Period (min)			15			

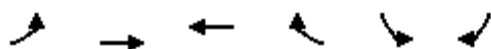
Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	27	332	11	27	406
Future Volume (Veh/h)	8	27	332	11	27	406
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.87	0.87	0.92	0.92
Hourly flow rate (vph)	9	29	382	13	29	441
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			169			
pX, platoon unblocked						
vC, conflicting volume	881	382			395	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	881	382			395	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	96			98	
cM capacity (veh/h)	309	665			1164	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	38	386	9	470		
Volume Left	9	0	0	29		
Volume Right	29	4	9	0		
cSH	523	1700	1700	1164		
Volume to Capacity	0.07	0.23	0.01	0.02		
Queue Length 95th (m)	1.9	0.0	0.0	0.6		
Control Delay (s)	12.4	0.0	0.0	0.8		
Lane LOS	B			A		
Approach Delay (s)	12.4	0.0		0.8		
Approach LOS	B					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			57.3%		ICU Level of Service	B
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
21: Mill Street & 112 Mill St. Access Road A

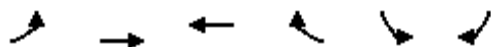
2029 Future Bkgd Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	56	124	0	1	6
Future Volume (Veh/h)	2	56	124	0	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	61	135	0	1	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	135				200	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135				200	135
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1449				788	914
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	63	135	8			
Volume Left	2	0	1			
Volume Right	0	0	7			
cSH	1449	1700	896			
Volume to Capacity	0.00	0.08	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.2	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			16.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
25: Mill Street & 112 Mill St. Access Road B

2029 Future Bkgd Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	50	104	1	3	20
Future Volume (Veh/h)	7	50	104	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	54	113	1	3	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	114				184	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	114				184	114
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1475				801	939
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	62	114	25			
Volume Left	8	0	3			
Volume Right	0	1	22			
cSH	1475	1700	920			
Volume to Capacity	0.01	0.07	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	1.0	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	1.0	0.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		18.5%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2029 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	44	111	45	65	86
Future Volume (Veh/h)	39	44	111	45	65	86
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	48	121	49	71	93
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	380	146			170	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	380	146			170	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	95			95	
cM capacity (veh/h)	590	902			1407	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	90	170	164			
Volume Left	42	0	71			
Volume Right	48	49	0			
cSH	724	1700	1407			
Volume to Capacity	0.12	0.10	0.05			
Queue Length 95th (m)	3.4	0.0	1.3			
Control Delay (s)	10.7	0.0	3.6			
Lane LOS	B		A			
Approach Delay (s)	10.7	0.0	3.6			
Approach LOS	B					
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			31.6%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

2029 Future Bkgd Traffic Volumes

28: 67 Mill St. Access Road B/112 Mill St. Access Road C & Mill Street

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	19	24	4	8	2	67	0	12	5	0	31
Future Volume (Veh/h)	11	19	24	4	8	2	67	0	12	5	0	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	21	26	4	9	2	73	0	13	5	0	34
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	11			47			110	77	34	89	89	10
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			47			110	77	34	89	89	10
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			91	100	99	99	100	97
cM capacity (veh/h)	1608			1560			834	805	1039	878	793	1071
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	59	15	86	39								
Volume Left	12	4	73	5								
Volume Right	26	2	13	34								
cSH	1608	1560	860	1042								
Volume to Capacity	0.01	0.00	0.10	0.04								
Queue Length 95th (m)	0.2	0.1	2.7	0.9								
Control Delay (s)	1.5	2.0	9.7	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.5	2.0	9.7	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			6.5									
Intersection Capacity Utilization			21.5%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2029 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	29	8	6	33	7	49	5	58	27	48	80	18
Future Volume (vph)	29	8	6	33	7	49	5	58	27	48	80	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	9	7	36	8	53	5	63	29	52	87	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	48	97	97	159								
Volume Left (vph)	32	36	5	52								
Volume Right (vph)	7	53	29	20								
Hadj (s)	0.08	-0.22	-0.14	0.02								
Departure Headway (s)	4.7	4.3	4.3	4.4								
Degree Utilization, x	0.06	0.12	0.12	0.19								
Capacity (veh/h)	713	776	801	785								
Control Delay (s)	8.0	7.9	7.8	8.4								
Approach Delay (s)	8.0	7.9	7.8	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.1									
Level of Service			A									
Intersection Capacity Utilization			26.6%		ICU Level of Service					A		
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2029 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	68	0	0	84	7	3	0	2	15	1	18
Future Volume (Veh/h)	13	68	0	0	84	7	3	0	2	15	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	74	0	0	91	8	3	0	2	16	1	20
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	99			74			218	201	74	199	197	95
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	99			74			218	201	74	199	197	95
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	98	100	98
cM capacity (veh/h)	1494			1526			717	689	988	753	692	962
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	88	99	5	37								
Volume Left	14	0	3	16								
Volume Right	0	8	2	20								
cSH	1494	1526	806	851								
Volume to Capacity	0.01	0.00	0.01	0.04								
Queue Length 95th (m)	0.2	0.0	0.1	1.1								
Control Delay (s)	1.2	0.0	9.5	9.4								
Lane LOS	A		A	A								
Approach Delay (s)	1.2	0.0	9.5	9.4								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			21.0%	ICU Level of Service					A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2029 Future Bkgd Traffic Volumes
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	
Traffic Volume (veh/h)	331	7	6	402	6	14
Future Volume (Veh/h)	331	7	6	402	6	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.88	0.88
Hourly flow rate (vph)	345	7	7	437	7	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			352		800	348
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			352		800	348
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1207		352	695
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	352	444	23			
Volume Left	0	7	7			
Volume Right	7	0	16			
cSH	1700	1207	536			
Volume to Capacity	0.21	0.01	0.04			
Queue Length 95th (m)	0.0	0.1	1.1			
Control Delay (s)	0.0	0.2	12.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	12.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			38.2%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Bkgd Traffic Volumes
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	293	95	25	393	17	184	60	30	35	70	89
Future Volume (vph)	33	293	95	25	393	17	184	60	30	35	70	89
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.98	1.00		0.98	0.99			0.97	
Frt		0.958			0.980			0.951			0.943	
Flt Protected	0.950			0.950			0.950				0.990	
Satd. Flow (prot)	1397	1425	0	1458	1544	0	1599	1627	0	0	1543	0
Flt Permitted	0.359			0.411			0.387				0.893	
Satd. Flow (perm)	526	1425	0	620	1544	0	641	1627	0	0	1387	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			9			24			30	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Peak Hour Factor	0.80	0.91	0.75	0.69	0.88	0.25	0.86	0.68	0.69	0.58	0.67	0.75
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Adj. Flow (vph)	41	322	127	36	447	68	214	88	43	60	104	119
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	449	0	36	515	0	214	131	0	0	283	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Bkgd Traffic Volumes
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		42.3	38.8			24.9	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.38	0.35			0.22	
v/c Ratio	0.14	0.58		0.11	0.62		0.64	0.23			0.85	
Control Delay	16.7	21.1		15.8	22.7		34.1	21.2			60.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	16.7	21.1		15.8	22.7		34.1	21.2			60.1	
LOS	B	C		B	C		C	C			E	
Approach Delay		20.8			22.3			29.2			60.1	
Approach LOS		C			C			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 111.5

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 29.7

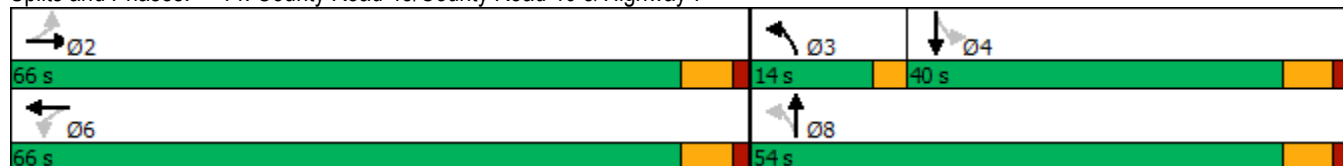
Intersection LOS: C

Intersection Capacity Utilization 70.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Bkgd Traffic Volumes
AM Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	41	449	36	515	214	131	283
v/c Ratio	0.14	0.58	0.11	0.62	0.64	0.23	0.85
Control Delay	16.7	21.1	15.8	22.7	34.1	21.2	60.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	21.1	15.8	22.7	34.1	21.2	60.1
Queue Length 50th (m)	4.6	63.1	3.9	77.7	34.6	16.9	56.3
Queue Length 95th (m)	11.2	110.9	8.3	127.0	51.3	21.7	58.5
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	283	779	334	836	337	710	440
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.58	0.11	0.62	0.64	0.18	0.64
Intersection Summary							

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	293	95	25	393	17	184	60	30	35	70	89
Future Volume (vph)	33	293	95	25	393	17	184	60	30	35	70	89
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00			1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1391	1425		1434	1544		1591	1627			1540	
Flt Permitted	0.36	1.00		0.41	1.00		0.39	1.00			0.89	
Satd. Flow (perm)	526	1425		621	1544		648	1627			1390	
Peak-hour factor, PHF	0.80	0.91	0.75	0.69	0.88	0.25	0.86	0.68	0.69	0.58	0.67	0.75
Adj. Flow (vph)	41	322	127	36	447	68	214	88	43	60	104	119
RTOR Reduction (vph)	0	11	0	0	4	0	0	16	0	0	23	0
Lane Group Flow (vph)	41	438	0	36	511	0	214	115	0	0	260	0
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		38.9	38.9			24.9	
Effective Green, g (s)	60.1	60.1		60.1	60.1		38.9	38.9			24.9	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.35	0.35			0.22	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	283	768		334	832		319	567			310	
v/s Ratio Prot		0.31			c0.33		c0.07	0.07				
v/s Ratio Perm	0.08			0.06			0.17				c0.19	
v/c Ratio	0.14	0.57		0.11	0.61		0.67	0.20			0.84	
Uniform Delay, d1	12.9	17.1		12.6	17.7		29.0	25.4			41.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.1	3.1		0.6	3.4		5.5	0.2			17.6	
Delay (s)	13.9	20.2		13.2	21.1		34.5	25.6			59.0	
Level of Service	B	C		B	C		C	C			E	
Approach Delay (s)		19.6			20.6			31.1			59.0	
Approach LOS		B			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			29.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			111.5			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			70.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	33	362	0	0	467
Future Volume (Veh/h)	12	33	362	0	0	467
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	13	36	398	0	0	486
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	884	398			398	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	884	398			398	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	95			100	
cM capacity (veh/h)	318	656			1172	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	49	398	486			
Volume Left	13	0	0			
Volume Right	36	0	0			
cSH	512	1700	1172			
Volume to Capacity	0.10	0.23	0.00			
Queue Length 95th (m)	2.5	0.0	0.0			
Control Delay (s)	12.8	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.8	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		36.7%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	25	10	10	10	4
Future Volume (Veh/h)	11	25	10	10	10	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	27	11	11	11	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	46	13	15			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46	13	15			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	99			
cM capacity (veh/h)	957	1067	1603			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	39	22	15			
Volume Left	12	11	0			
Volume Right	27	0	4			
cSH	1031	1603	1700			
Volume to Capacity	0.04	0.01	0.01			
Queue Length 95th (m)	0.9	0.2	0.0			
Control Delay (s)	8.6	3.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.6	3.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization		17.7%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
7: King Street & Mill Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	12	2	77	96	1	55
Future Volume (Veh/h)	12	2	77	96	1	55
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	2	84	104	1	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			15		286	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			15		286	14
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		100	94
cM capacity (veh/h)			1603		667	1066
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	15	188	61			
Volume Left	0	84	1			
Volume Right	2	0	60			
cSH	1700	1603	1056			
Volume to Capacity	0.01	0.05	0.06			
Queue Length 95th (m)	0.0	1.3	1.5			
Control Delay (s)	0.0	3.5	8.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.5	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization		26.1%	ICU Level of Service		A	
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
8: 67 Mill St. Access Road A & Mill Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	51	16	3	121	44	8
Future Volume (Veh/h)	51	16	3	121	44	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	17	3	132	48	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			72		202	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			72		202	64
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1528		786	1001
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	72	135	57			
Volume Left	0	3	48			
Volume Right	17	0	9			
cSH	1700	1528	813			
Volume to Capacity	0.04	0.00	0.07			
Queue Length 95th (m)	0.0	0.0	1.8			
Control Delay (s)	0.0	0.2	9.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.2	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			18.8%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	13	350	19	26	453
Future Volume (Veh/h)	20	13	350	19	26	453
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	22	14	385	21	27	472
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (m)			376			
pX, platoon unblocked						
vC, conflicting volume	922	396			406	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	922	396			406	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	98			98	
cM capacity (veh/h)	293	654			1153	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	36	406	27	472		
Volume Left	22	0	27	0		
Volume Right	14	21	0	0		
cSH	373	1700	1153	1700		
Volume to Capacity	0.10	0.24	0.02	0.28		
Queue Length 95th (m)	2.5	0.0	0.6	0.0		
Control Delay (s)	15.7	0.0	8.2	0.0		
Lane LOS	C		A			
Approach Delay (s)	15.7	0.0	0.4			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			35.9%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	10	0	13	0	355	21	30	443	0
Future Volume (Veh/h)	0	0	0	10	0	13	0	355	21	30	443	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	11	0	14	0	408	24	33	482	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked												
vC, conflicting volume	982	980	482	968	968	420	482			432		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	982	980	482	968	968	420	482			432		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	100	98	100			97		
cM capacity (veh/h)	218	242	584	228	246	633	1081			1128		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	25	432	33	482							
Volume Left	0	11	0	33	0							
Volume Right	0	14	24	0	0							
cSH	1700	355	1081	1128	1700							
Volume to Capacity	0.00	0.07	0.00	0.03	0.28							
Queue Length 95th (m)	0.0	1.8	0.0	0.7	0.0							
Control Delay (s)	0.0	15.9	0.0	8.3	0.0							
Lane LOS	A	C		A								
Approach Delay (s)	0.0	15.9	0.0	0.5								
Approach LOS	A	C										
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			37.1%		ICU Level of Service				A			
Analysis Period (min)			15									

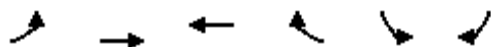
Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	28	135	138	25	59	130
Future Volume (Veh/h)	28	135	138	25	59	130
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	147	150	27	64	141
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	419	150			150	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	419	150			150	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	84			96	
cM capacity (veh/h)	564	896			1431	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	177	150	27	205		
Volume Left	30	0	0	64		
Volume Right	147	0	27	0		
cSH	815	1700	1700	1431		
Volume to Capacity	0.22	0.09	0.02	0.04		
Queue Length 95th (m)	6.6	0.0	0.0	1.1		
Control Delay (s)	10.6	0.0	0.0	2.6		
Lane LOS	B			A		
Approach Delay (s)	10.6	0.0		2.6		
Approach LOS	B					
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			37.2%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
21: Mill Street & 112 Mill St. Access Road A

2034 Future Bkgd Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	57	124	0	1	6
Future Volume (Veh/h)	2	57	124	0	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	62	135	0	1	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	135				201	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135				201	135
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1449				786	914
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	64	135	8			
Volume Left	2	0	1			
Volume Right	0	0	7			
cSH	1449	1700	896			
Volume to Capacity	0.00	0.08	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.2	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			16.5%		ICU Level of Service	
Analysis Period (min)			15			
			A			

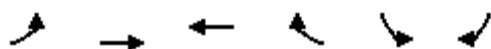
Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	28	348	11	28	425
Future Volume (Veh/h)	9	28	348	11	28	425
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.87	0.87	0.92	0.92
Hourly flow rate (vph)	10	30	400	13	30	462
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			169			
pX, platoon unblocked						
vC, conflicting volume	922	400			413	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	922	400			413	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	95			97	
cM capacity (veh/h)	292	650			1146	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	40	404	9	492		
Volume Left	10	0	0	30		
Volume Right	30	4	9	0		
cSH	498	1700	1700	1146		
Volume to Capacity	0.08	0.24	0.01	0.03		
Queue Length 95th (m)	2.1	0.0	0.0	0.6		
Control Delay (s)	12.9	0.0	0.0	0.8		
Lane LOS	B			A		
Approach Delay (s)	12.9	0.0		0.8		
Approach LOS	B					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			59.2%		ICU Level of Service	B
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
25: Mill Street & 112 Mill St. Access Road B

2034 Future Bkgd Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	51	104	1	3	20
Future Volume (Veh/h)	7	51	104	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	55	113	1	3	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	114				184	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	114				184	114
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1475				800	939
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	63	114	25			
Volume Left	8	0	3			
Volume Right	0	1	22			
cSH	1475	1700	920			
Volume to Capacity	0.01	0.07	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	1.0	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	1.0	0.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization		18.6%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2034 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	46	117	47	68	90
Future Volume (Veh/h)	40	46	117	47	68	90
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	50	127	51	74	98
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	398	152			178	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	398	152			178	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	94			95	
cM capacity (veh/h)	575	894			1398	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	93	178	172			
Volume Left	43	0	74			
Volume Right	50	51	0			
cSH	711	1700	1398			
Volume to Capacity	0.13	0.10	0.05			
Queue Length 95th (m)	3.6	0.0	1.3			
Control Delay (s)	10.8	0.0	3.6			
Lane LOS	B		A			
Approach Delay (s)	10.8	0.0	3.6			
Approach LOS	B					
Intersection Summary						
Average Delay		3.7				
Intersection Capacity Utilization		32.6%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development

2034 Future Bkgd Traffic Volumes

28: 67 Mill St. Access Road B/112 Mill St. Access Road C & Mill Street

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	19	24	4	8	2	67	0	12	5	0	31
Future Volume (Veh/h)	11	19	24	4	8	2	67	0	12	5	0	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	21	26	4	9	2	73	0	13	5	0	34
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	11			47			110	77	34	89	89	10
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			47			110	77	34	89	89	10
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			91	100	99	99	100	97
cM capacity (veh/h)	1608			1560			834	805	1039	878	793	1071
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	59	15	86	39								
Volume Left	12	4	73	5								
Volume Right	26	2	13	34								
cSH	1608	1560	860	1042								
Volume to Capacity	0.01	0.00	0.10	0.04								
Queue Length 95th (m)	0.2	0.1	2.7	0.9								
Control Delay (s)	1.5	2.0	9.7	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.5	2.0	9.7	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			6.5									
Intersection Capacity Utilization			21.5%	ICU Level of Service								
Analysis Period (min)			15	A								

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2034 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	9	7	34	8	51	6	60	28	50	83	19
Future Volume (vph)	30	9	7	34	8	51	6	60	28	50	83	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	10	8	37	9	55	7	65	30	54	90	21
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	101	102	165								
Volume Left (vph)	33	37	7	54								
Volume Right (vph)	8	55	30	21								
Hadj (s)	0.07	-0.22	-0.13	0.02								
Departure Headway (s)	4.7	4.4	4.3	4.4								
Degree Utilization, x	0.07	0.12	0.12	0.20								
Capacity (veh/h)	708	769	793	780								
Control Delay (s)	8.0	8.0	7.9	8.5								
Approach Delay (s)	8.0	8.0	7.9	8.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.2									
Level of Service			A									
Intersection Capacity Utilization			27.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2034 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	71	0	0	88	7	3	0	2	15	1	19
Future Volume (Veh/h)	14	71	0	0	88	7	3	0	2	15	1	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	77	0	0	96	8	3	0	2	16	1	21
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	104			77			228	211	77	209	207	100
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	104			77			228	211	77	209	207	100
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	98	100	98
cM capacity (veh/h)	1488			1522			704	679	984	741	683	956
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	92	104	5	38								
Volume Left	15	0	3	16								
Volume Right	0	8	2	21								
cSH	1488	1522	795	844								
Volume to Capacity	0.01	0.00	0.01	0.05								
Queue Length 95th (m)	0.2	0.0	0.2	1.1								
Control Delay (s)	1.3	0.0	9.6	9.5								
Lane LOS	A		A	A								
Approach Delay (s)	1.3	0.0	9.6	9.5								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			21.2%	ICU Level of Service						A		
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2034 Future Bkgd Traffic Volumes
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	346	8	6	422	7	14
Future Volume (Veh/h)	346	8	6	422	7	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.88	0.88
Hourly flow rate (vph)	360	8	7	459	8	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			368		837	364
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			368		837	364
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1191		335	681
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	368	466	24			
Volume Left	0	7	8			
Volume Right	8	0	16			
cSH	1700	1191	506			
Volume to Capacity	0.22	0.01	0.05			
Queue Length 95th (m)	0.0	0.1	1.2			
Control Delay (s)	0.0	0.2	12.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	12.5			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			39.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Bkgd Traffic Volumes
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	307	99	24	412	17	188	62	32	37	73	91
Future Volume (vph)	33	307	99	24	412	17	188	62	32	37	73	91
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.98	1.00		0.99	0.99			0.97	
Frt		0.958			0.981			0.950			0.944	
Flt Protected	0.950			0.950			0.950				0.989	
Satd. Flow (prot)	1397	1425	0	1458	1545	0	1599	1625	0	0	1543	0
Flt Permitted	0.340			0.392			0.387				0.888	
Satd. Flow (perm)	498	1425	0	592	1545	0	642	1625	0	0	1381	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			9			25			29	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Peak Hour Factor	0.80	0.91	0.75	0.69	0.88	0.25	0.86	0.68	0.69	0.58	0.67	0.75
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Adj. Flow (vph)	41	337	132	35	468	68	219	91	46	64	109	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	469	0	35	536	0	219	137	0	0	294	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Bkgd Traffic Volumes
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		43.5	40.0			26.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53		0.39	0.35			0.23	
v/c Ratio	0.15	0.61		0.11	0.65		0.64	0.23			0.86	
Control Delay	17.4	22.6		16.3	24.3		34.2	21.1			61.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	17.4	22.6		16.3	24.3		34.2	21.1			61.4	
LOS	B	C		B	C		C	C			E	
Approach Delay		22.2			23.8			29.2			61.4	
Approach LOS		C			C			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 112.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 30.8

Intersection LOS: C

Intersection Capacity Utilization 70.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7

66 s	14 s	40 s
66 s	54 s	

Norwood-Upper Mill Pond Development
 14: County Road 45/County Road 40 & Highway 7

2039 Future Bkgd Traffic Volumes
 AM Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	41	469	35	536	219	137	294
v/c Ratio	0.15	0.61	0.11	0.65	0.64	0.23	0.86
Control Delay	17.4	22.6	16.3	24.3	34.2	21.1	61.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	22.6	16.3	24.3	34.2	21.1	61.4
Queue Length 50th (m)	4.7	70.0	3.9	85.1	35.6	17.8	59.7
Queue Length 95th (m)	11.3	118.6	8.2	135.0	52.4	22.6	61.4
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	265	770	315	828	341	703	433
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.61	0.11	0.65	0.64	0.19	0.68
Intersection Summary							

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	307	99	24	412	17	188	62	32	37	73	91
Future Volume (vph)	33	307	99	24	412	17	188	62	32	37	73	91
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00			1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1391	1425		1435	1545		1591	1625			1542	
Flt Permitted	0.34	1.00		0.39	1.00		0.39	1.00			0.89	
Satd. Flow (perm)	497	1425		592	1545		649	1625			1384	
Peak-hour factor, PHF	0.80	0.91	0.75	0.69	0.88	0.25	0.86	0.68	0.69	0.58	0.67	0.75
Adj. Flow (vph)	41	337	132	35	468	68	219	91	46	64	109	121
RTOR Reduction (vph)	0	11	0	0	4	0	0	16	0	0	22	0
Lane Group Flow (vph)	41	458	0	35	532	0	219	121	0	0	272	0
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		40.0	40.0			26.0	
Effective Green, g (s)	60.1	60.1		60.1	60.1		40.0	40.0			26.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53		0.36	0.36			0.23	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	265	760		315	824		322	577			319	
v/s Ratio Prot		0.32			c0.34		c0.07	0.07				
v/s Ratio Perm	0.08			0.06			0.17				c0.20	
v/c Ratio	0.15	0.60		0.11	0.65		0.68	0.21			0.85	
Uniform Delay, d1	13.3	18.0		13.0	18.7		29.3	25.3			41.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.2	3.5		0.7	3.9		5.8	0.2			19.1	
Delay (s)	14.6	21.6		13.7	22.6		35.1	25.5			60.6	
Level of Service	B	C		B	C		D	C			E	
Approach Delay (s)		21.0			22.0			31.4			60.6	
Approach LOS		C			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			30.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			112.6			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			70.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	33	380	0	0	490
Future Volume (Veh/h)	12	33	380	0	0	490
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	13	36	418	0	0	510
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	928	418			418	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	928	418			418	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	94			100	
cM capacity (veh/h)	300	639			1152	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	49	418	510			
Volume Left	13	0	0			
Volume Right	36	0	0			
cSH	492	1700	1152			
Volume to Capacity	0.10	0.25	0.00			
Queue Length 95th (m)	2.6	0.0	0.0			
Control Delay (s)	13.1	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.1	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		38.0%	ICU Level of Service	A		
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	26	11	11	11	4
Future Volume (Veh/h)	11	26	11	11	11	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	28	12	12	12	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	50	14	16			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	50	14	16			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	99			
cM capacity (veh/h)	952	1066	1602			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	40	24	16			
Volume Left	12	12	0			
Volume Right	28	0	4			
cSH	1029	1602	1700			
Volume to Capacity	0.04	0.01	0.01			
Queue Length 95th (m)	1.0	0.2	0.0			
Control Delay (s)	8.6	3.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.6	3.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.4			
Intersection Capacity Utilization		17.9%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street & Mill Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	12	2	77	97	1	55
Future Volume (Veh/h)	12	2	77	97	1	55
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	2	84	105	1	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			15		287	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			15		287	14
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		100	94
cM capacity (veh/h)			1603		667	1066
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	15	189	61			
Volume Left	0	84	1			
Volume Right	2	0	60			
cSH	1700	1603	1056			
Volume to Capacity	0.01	0.05	0.06			
Queue Length 95th (m)	0.0	1.3	1.5			
Control Delay (s)	0.0	3.5	8.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.5	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization			26.2%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
8: 67 Mill St. Access Road A & Mill Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	51	16	3	121	44	8
Future Volume (Veh/h)	51	16	3	121	44	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	17	3	132	48	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			72		202	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			72		202	64
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1528		786	1001
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	72	135	57			
Volume Left	0	3	48			
Volume Right	17	0	9			
cSH	1700	1528	813			
Volume to Capacity	0.04	0.00	0.07			
Queue Length 95th (m)	0.0	0.0	1.8			
Control Delay (s)	0.0	0.2	9.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.2	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			18.8%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	14	367	19	27	476
Future Volume (Veh/h)	20	14	367	19	27	476
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	22	15	403	21	28	496
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (m)			376			
pX, platoon unblocked						
vC, conflicting volume	966	414			424	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	966	414			424	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	98			98	
cM capacity (veh/h)	276	639			1135	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	37	424	28	496		
Volume Left	22	0	28	0		
Volume Right	15	21	0	0		
cSH	358	1700	1135	1700		
Volume to Capacity	0.10	0.25	0.02	0.29		
Queue Length 95th (m)	2.7	0.0	0.6	0.0		
Control Delay (s)	16.2	0.0	8.3	0.0		
Lane LOS	C		A			
Approach Delay (s)	16.2	0.0	0.4			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			37.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	11	0	14	0	372	21	32	464	0
Future Volume (Veh/h)	0	0	0	11	0	14	0	372	21	32	464	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	12	0	15	0	428	24	35	504	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked												
vC, conflicting volume	1029	1026	504	1014	1014	440	504			452		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1029	1026	504	1014	1014	440	504			452		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	94	100	98	100			97		
cM capacity (veh/h)	202	227	568	212	231	617	1061			1109		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	27	452	35	504							
Volume Left	0	12	0	35	0							
Volume Right	0	15	24	0	0							
cSH	1700	334	1061	1109	1700							
Volume to Capacity	0.00	0.08	0.00	0.03	0.30							
Queue Length 95th (m)	0.0	2.1	0.0	0.8	0.0							
Control Delay (s)	0.0	16.7	0.0	8.4	0.0							
Lane LOS	A	C		A								
Approach Delay (s)	0.0	16.7	0.0	0.5								
Approach LOS	A	C										
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			38.9%		ICU Level of Service				A			
Analysis Period (min)			15									

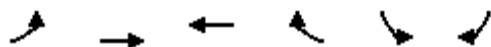
Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	29	137	145	26	61	136
Future Volume (Veh/h)	29	137	145	26	61	136
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	149	158	28	66	148
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	438	158			158	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438	158			158	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	83			95	
cM capacity (veh/h)	549	887			1422	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	181	158	28	214		
Volume Left	32	0	0	66		
Volume Right	149	0	28	0		
cSH	800	1700	1700	1422		
Volume to Capacity	0.23	0.09	0.02	0.05		
Queue Length 95th (m)	6.9	0.0	0.0	1.2		
Control Delay (s)	10.8	0.0	0.0	2.6		
Lane LOS	B			A		
Approach Delay (s)	10.8	0.0		2.6		
Approach LOS	B					
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			38.2%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
21: Mill Street & 112 Mill St. Access Road A

2039 Future Bkgd Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	57	124	0	1	6
Future Volume (Veh/h)	2	57	124	0	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	62	135	0	1	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	135				201	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135				201	135
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1449				786	914
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	64	135	8			
Volume Left	2	0	1			
Volume Right	0	0	7			
cSH	1449	1700	896			
Volume to Capacity	0.00	0.08	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.2	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			16.5%	ICU Level of Service	A	
Analysis Period (min)			15			

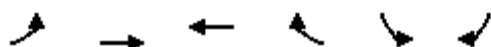
Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	29	364	12	29	445
Future Volume (Veh/h)	9	29	364	12	29	445
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.87	0.87	0.92	0.92
Hourly flow rate (vph)	10	32	418	14	32	484
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			169			
pX, platoon unblocked						
vC, conflicting volume	966	418			432	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	966	418			432	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	95			97	
cM capacity (veh/h)	274	635			1128	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	42	423	9	516		
Volume Left	10	0	0	32		
Volume Right	32	5	9	0		
cSH	484	1700	1700	1128		
Volume to Capacity	0.09	0.25	0.01	0.03		
Queue Length 95th (m)	2.3	0.0	0.0	0.7		
Control Delay (s)	13.2	0.0	0.0	0.8		
Lane LOS	B			A		
Approach Delay (s)	13.2	0.0		0.8		
Approach LOS	B					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			61.2%	ICU Level of Service		B
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
25: Mill Street & 112 Mill St. Access Road B

2039 Future Bkgd Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	51	104	1	3	20
Future Volume (Veh/h)	7	51	104	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	55	113	1	3	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	114				184	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	114				184	114
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1475				800	939
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	63	114	25			
Volume Left	8	0	3			
Volume Right	0	1	22			
cSH	1475	1700	920			
Volume to Capacity	0.01	0.07	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	1.0	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	1.0	0.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			18.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2039 Future Bkgd Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	42	48	123	49	72	94
Future Volume (Veh/h)	42	48	123	49	72	94
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	52	134	53	78	102
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	418	160			187	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	418	160			187	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	94			94	
cM capacity (veh/h)	558	885			1387	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	98	187	180			
Volume Left	46	0	78			
Volume Right	52	53	0			
cSH	694	1700	1387			
Volume to Capacity	0.14	0.11	0.06			
Queue Length 95th (m)	3.9	0.0	1.4			
Control Delay (s)	11.0	0.0	3.6			
Lane LOS	B		A			
Approach Delay (s)	11.0	0.0	3.6			
Approach LOS	B					
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			33.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

2039 Future Bkgd Traffic Volumes

28: 67 Mill St. Access Road B/112 Mill St. Access Road C & Mill Street

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	19	24	4	8	2	67	0	12	5	0	31
Future Volume (Veh/h)	11	19	24	4	8	2	67	0	12	5	0	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	21	26	4	9	2	73	0	13	5	0	34
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	11			47			110	77	34	89	89	10
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			47			110	77	34	89	89	10
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			91	100	99	99	100	97
cM capacity (veh/h)	1608			1560			834	805	1039	878	793	1071
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	59	15	86	39								
Volume Left	12	4	73	5								
Volume Right	26	2	13	34								
cSH	1608	1560	860	1042								
Volume to Capacity	0.01	0.00	0.10	0.04								
Queue Length 95th (m)	0.2	0.1	2.7	0.9								
Control Delay (s)	1.5	2.0	9.7	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.5	2.0	9.7	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			6.5									
Intersection Capacity Utilization			21.5%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2039 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	32	9	7	36	8	54	6	63	29	53	86	20
Future Volume (vph)	32	9	7	36	8	54	6	63	29	53	86	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	10	8	39	9	59	7	68	32	58	93	22
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	53	107	107	173								
Volume Left (vph)	35	39	7	58								
Volume Right (vph)	8	59	32	22								
Hadj (s)	0.08	-0.22	-0.13	0.02								
Departure Headway (s)	4.7	4.4	4.3	4.4								
Degree Utilization, x	0.07	0.13	0.13	0.21								
Capacity (veh/h)	700	762	787	774								
Control Delay (s)	8.1	8.0	8.0	8.6								
Approach Delay (s)	8.1	8.0	8.0	8.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			27.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2039 Future Bkgd Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	75	0	0	93	7	4	0	2	16	1	19
Future Volume (Veh/h)	14	75	0	0	93	7	4	0	2	16	1	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	82	0	0	101	8	4	0	2	17	1	21
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	109			82			238	221	82	219	217	105
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	109			82			238	221	82	219	217	105
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	98	100	98
cM capacity (veh/h)	1481			1515			694	671	978	730	674	949
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	97	109	6	39								
Volume Left	15	0	4	17								
Volume Right	0	8	2	21								
cSH	1481	1515	768	832								
Volume to Capacity	0.01	0.00	0.01	0.05								
Queue Length 95th (m)	0.2	0.0	0.2	1.2								
Control Delay (s)	1.2	0.0	9.7	9.5								
Lane LOS	A		A	A								
Approach Delay (s)	1.2	0.0	9.7	9.5								
Approach LOS			A	A								
Intersection Summary												
Average Delay	2.2											
Intersection Capacity Utilization	21.4%			ICU Level of Service					A			
Analysis Period (min)	15											

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

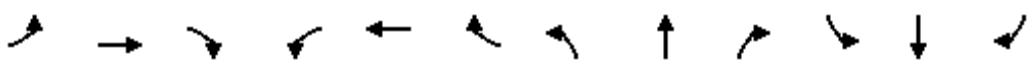
2039 Future Bkgd Traffic Volumes
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	362	8	6	443	7	15
Future Volume (Veh/h)	362	8	6	443	7	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.88	0.88
Hourly flow rate (vph)	377	8	7	482	8	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			385		877	381
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			385		877	381
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	97
cM capacity (veh/h)			1173		317	666
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	385	489	25			
Volume Left	0	7	8			
Volume Right	8	0	17			
cSH	1700	1173	493			
Volume to Capacity	0.23	0.01	0.05			
Queue Length 95th (m)	0.0	0.1	1.3			
Control Delay (s)	0.0	0.2	12.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	12.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			40.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Background Traffic Volumes

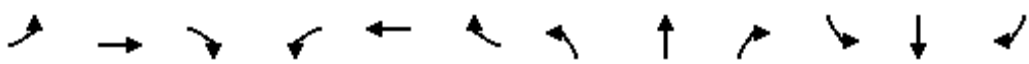
PM Peak hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	592	182	30	422	41	154	86	34	52	86	69
Future Volume (vph)	113	592	182	30	422	41	154	86	34	52	86	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			1.00		0.98	0.99			0.98	
Frt		0.966			0.986			0.964			0.953	
Flt Protected	0.950			0.950			0.950				0.987	
Satd. Flow (prot)	1662	1618	0	1662	1551	0	1568	1629	0	0	1549	0
Flt Permitted	0.353			0.123			0.442				0.857	
Satd. Flow (perm)	615	1618	0	215	1551	0	715	1629	0	0	1344	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			6			16			22	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Peak Hour Factor	0.87	0.89	0.92	0.72	0.87	0.81	0.89	0.71	0.89	0.83	0.94	0.84
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Adj. Flow (vph)	130	665	198	42	485	51	173	121	38	63	91	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	863	0	42	536	0	173	159	0	0	236	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Background Traffic Volumes

PM Peak hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.2	60.2		60.2	60.2		39.5	36.1			22.4	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.36	0.33			0.21	
v/c Ratio	0.38	0.96		0.36	0.62		0.51	0.29			0.80	
Control Delay	20.1	46.2		27.5	22.0		29.8	24.8			57.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	20.1	46.2		27.5	22.0		29.8	24.8			57.1	
LOS	C	D		C	C		C	C			E	
Approach Delay		42.8			22.4			27.4			57.1	
Approach LOS		D			C			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 108.9

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 36.5

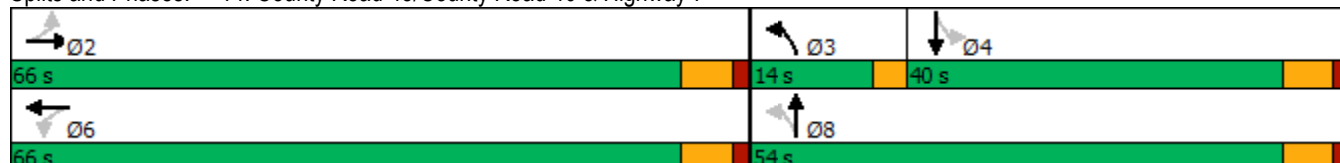
Intersection LOS: D

Intersection Capacity Utilization 106.3%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Background Traffic Volumes
PM Peak hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	130	863	42	536	173	159	236
v/c Ratio	0.38	0.96	0.36	0.62	0.51	0.29	0.80
Control Delay	20.1	46.2	27.5	22.0	29.8	24.8	57.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	46.2	27.5	22.0	29.8	24.8	57.1
Queue Length 50th (m)	15.7	172.3	5.0	77.1	27.2	23.2	46.0
Queue Length 95th (m)	36.5	#306.5	13.0	132.5	43.7	29.6	74.8
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	339	902	118	860	346	724	432
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.96	0.36	0.62	0.50	0.22	0.55

Intersection Summary

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

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Background Traffic Volumes

PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	592	182	30	422	41	154	86	34	52	86	69
Future Volume (vph)	113	592	182	30	422	41	154	86	34	52	86	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1655	1618		1662	1551		1557	1629			1550	
Flt Permitted	0.35	1.00		0.12	1.00		0.44	1.00			0.86	
Satd. Flow (perm)	614	1618		214	1551		725	1629			1346	
Peak-hour factor, PHF	0.87	0.89	0.92	0.72	0.87	0.81	0.89	0.71	0.89	0.83	0.94	0.84
Adj. Flow (vph)	130	665	198	42	485	51	173	121	38	63	91	82
RTOR Reduction (vph)	0	8	0	0	3	0	0	11	0	0	17	0
Lane Group Flow (vph)	130	855	0	42	533	0	173	148	0	0	219	0
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.2	60.2		60.2	60.2		36.1	36.1			22.4	
Effective Green, g (s)	60.2	60.2		60.2	60.2		36.1	36.1			22.4	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.33	0.33			0.21	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	339	895		118	858		322	540			277	
v/s Ratio Prot		c0.53			0.34		c0.05	0.09				
v/s Ratio Perm	0.21			0.20			0.13				c0.16	
v/c Ratio	0.38	0.96		0.36	0.62		0.54	0.27			0.79	
Uniform Delay, d1	13.8	23.0		13.5	16.5		28.3	26.7			41.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	3.3	21.0		8.2	3.4		1.7	0.3			13.8	
Delay (s)	17.0	44.0		21.7	19.9		30.0	27.0			54.8	
Level of Service	B	D		C	B		C	C			D	
Approach Delay (s)		40.5			20.1			28.6			54.8	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			34.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			108.8			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			106.3%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2029 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	27	636	6	5	542
Future Volume (Veh/h)	11	27	636	6	5	542
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91
Hourly flow rate (vph)	12	29	715	7	5	596
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1324	718			722	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1324	718			722	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	93			99	
cM capacity (veh/h)	173	432			889	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	41	722	601			
Volume Left	12	0	5			
Volume Right	29	7	0			
cSH	300	1700	889			
Volume to Capacity	0.14	0.42	0.01			
Queue Length 95th (m)	3.7	0.0	0.1			
Control Delay (s)	18.9	0.0	0.2			
Lane LOS	C		A			
Approach Delay (s)	18.9	0.0	0.2			
Approach LOS	C					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		46.7%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2029 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	19	30	6	11	13
Future Volume (Veh/h)	11	19	30	6	11	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	21	33	7	12	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	92	19	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	92	19	26			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	98	98			
cM capacity (veh/h)	889	1059	1588			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	33	40	26			
Volume Left	12	33	0			
Volume Right	21	0	14			
cSH	990	1588	1700			
Volume to Capacity	0.03	0.02	0.02			
Queue Length 95th (m)	0.8	0.5	0.0			
Control Delay (s)	8.8	6.1	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	6.1	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.4			
Intersection Capacity Utilization		18.6%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street & Mill Street

2029 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	30	5	55	68	10	172
Future Volume (Veh/h)	30	5	55	68	10	172
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	5	60	74	11	187
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			38		230	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		230	36
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	82
cM capacity (veh/h)			1572		730	1037
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	38	134	198			
Volume Left	0	60	11			
Volume Right	5	0	187			
cSH	1700	1572	1013			
Volume to Capacity	0.02	0.04	0.20			
Queue Length 95th (m)	0.0	1.0	5.8			
Control Delay (s)	0.0	3.5	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.5	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			31.1%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2029 Future Background Traffic Volumes
PM Peak hour

											
Movement	WBL	WBR	NBT	NBR	SBL	SBT					
Lane Configurations											
Traffic Volume (veh/h)	16	28	615	36	51	502					
Future Volume (Veh/h)	16	28	615	36	51	502					
Sign Control	Stop		Free		Free	Free					
Grade	0%		0%			0%					
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91					
Hourly flow rate (vph)	17	30	691	40	56	552					
Pedestrians											
Lane Width (m)											
Walking Speed (m/s)											
Percent Blockage											
Right turn flare (veh)											
Median type			None		None						
Median storage veh											
Upstream signal (m)			376								
pX, platoon unblocked	0.65	0.65			0.65						
vC, conflicting volume	1375	711			731						
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	1308	286			316						
tC, single (s)	6.4	6.2			4.1						
tC, 2 stage (s)											
tF (s)	3.5	3.3			2.2						
p0 queue free %	84	94			93						
cM capacity (veh/h)	106	489			808						
Direction, Lane #	WB 1	NB 1	SB 1	SB 2							
Volume Total	47	731	37	571							
Volume Left	17	0	37	19							
Volume Right	30	40	0	0							
cSH	213	1700	808	808							
Volume to Capacity	0.22	0.43	0.07	0.07							
Queue Length 95th (m)	6.5	0.0	1.8	1.8							
Control Delay (s)	26.7	0.0	9.8	1.3							
Lane LOS	D		A	A							
Approach Delay (s)	26.7	0.0	1.8								
Approach LOS	D										
Intersection Summary											
Average Delay			1.7								
Intersection Capacity Utilization			47.5%	ICU Level of Service	A						
Analysis Period (min)			15								

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2029 Future Background Traffic Volumes

PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	12	0	12	0	639	56	8	510	0
Future Volume (Veh/h)	0	0	0	12	0	12	0	639	56	8	510	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	0	0	0	13	0	13	0	718	63	9	560	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked	0.54	0.54		0.54	0.54	0.54				0.54		
vC, conflicting volume	1340	1359	560	1328	1328	750	560			781		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1206	1240	560	1182	1182	117	560			175		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	85	100	97	100			99		
cM capacity (veh/h)	84	94	528	90	102	507	1011			760		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	26	781	9	560							
Volume Left	0	13	0	9	0							
Volume Right	0	13	63	0	0							
cSH	1700	152	1011	760	1700							
Volume to Capacity	0.00	0.17	0.00	0.01	0.33							
Queue Length 95th (m)	0.0	4.8	0.0	0.3	0.0							
Control Delay (s)	0.0	33.4	0.0	9.8	0.0							
Lane LOS	A	D		A								
Approach Delay (s)	0.0	33.4	0.0	0.2								
Approach LOS	A	D										
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			50.2%		ICU Level of Service					A		
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2029 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	114	153	32	130	171
Future Volume (Veh/h)	38	114	153	32	130	171
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	124	166	35	141	186
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	652	184			201	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652	184			201	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	86			90	
cM capacity (veh/h)	388	859			1371	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	165	201	327			
Volume Left	41	0	141			
Volume Right	124	35	0			
cSH	660	1700	1371			
Volume to Capacity	0.25	0.12	0.10			
Queue Length 95th (m)	7.9	0.0	2.7			
Control Delay (s)	12.3	0.0	3.9			
Lane LOS	B		A			
Approach Delay (s)	12.3	0.0	3.9			
Approach LOS	B					
Intersection Summary						
Average Delay		4.8				
Intersection Capacity Utilization		45.3%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2029 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	36	658	18	33	489
Future Volume (Veh/h)	3	36	658	18	33	489
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91
Hourly flow rate (vph)	3	39	739	20	36	537
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			169			
pX, platoon unblocked	0.53	0.53			0.53	
vC, conflicting volume	1358	749			759	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1232	85			104	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	92			95	
cM capacity (veh/h)	99	517			790	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	42	759	573			
Volume Left	3	0	36			
Volume Right	39	20	0			
cSH	397	1700	790			
Volume to Capacity	0.11	0.45	0.05			
Queue Length 95th (m)	2.8	0.0	1.1			
Control Delay (s)	15.1	0.0	1.2			
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	1.2			
Approach LOS	C					
Intersection Summary						
Average Delay		1.0				
Intersection Capacity Utilization		67.4%		ICU Level of Service		C
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2029 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	18	167	19	34	175
Future Volume (Veh/h)	19	18	167	19	34	175
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	20	182	21	37	190
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	456	192			203	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	456	192			203	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			97	
cM capacity (veh/h)	547	849			1369	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	41	203	227			
Volume Left	21	0	37			
Volume Right	20	21	0			
cSH	662	1700	1369			
Volume to Capacity	0.06	0.12	0.03			
Queue Length 95th (m)	1.6	0.0	0.7			
Control Delay (s)	10.8	0.0	1.5			
Lane LOS	B		A			
Approach Delay (s)	10.8	0.0	1.5			
Approach LOS	B					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization		34.4%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2029 Future Background Traffic Volumes
PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	5	3	35	10	63	5	117	41	68	107	18
Future Volume (vph)	11	5	3	35	10	63	5	117	41	68	107	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	5	3	38	11	68	5	127	45	74	116	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	20	117	177	210								
Volume Left (vph)	12	38	5	74								
Volume Right (vph)	3	68	45	20								
Hadj (s)	0.06	-0.25	-0.11	0.05								
Departure Headway (s)	5.0	4.6	4.4	4.5								
Degree Utilization, x	0.03	0.15	0.21	0.26								
Capacity (veh/h)	647	724	790	769								
Control Delay (s)	8.1	8.3	8.5	9.1								
Approach Delay (s)	8.1	8.3	8.5	9.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.7									
Level of Service			A									
Intersection Capacity Utilization			36.1%	ICU Level of Service				A				
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2029 Future Background Traffic Volumes
PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	111	3	2	96	21	1	0	1	9	1	12
Future Volume (Veh/h)	16	111	3	2	96	21	1	0	1	9	1	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	121	3	2	104	23	1	0	1	10	1	13
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	127			124			290	288	122	277	278	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	127			124			290	288	122	277	278	116
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	99	100	99
cM capacity (veh/h)	1459			1463			646	614	929	668	622	937
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	141	129	2	24								
Volume Left	17	2	1	10								
Volume Right	3	23	1	13								
cSH	1459	1463	762	788								
Volume to Capacity	0.01	0.00	0.00	0.03								
Queue Length 95th (m)	0.3	0.0	0.1	0.8								
Control Delay (s)	1.0	0.1	9.7	9.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.0	0.1	9.7	9.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			23.6%		ICU Level of Service		A					
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2029 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	594	8	16	535	5	12
Future Volume (Veh/h)	594	8	16	535	5	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.91	0.91	0.50	0.50
Hourly flow rate (vph)	639	9	18	588	10	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			648		1268	644
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			648		1268	644
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	95
cM capacity (veh/h)			938		183	473
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	648	606	34			
Volume Left	0	18	10			
Volume Right	9	0	24			
cSH	1700	938	322			
Volume to Capacity	0.38	0.02	0.11			
Queue Length 95th (m)	0.0	0.5	2.8			
Control Delay (s)	0.0	0.5	17.5			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.5	17.5			
Approach LOS			C			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			54.6%	ICU Level of Service		A
Analysis Period (min)			15			

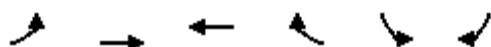
Norwood-Upper Mill Pond Development
8: 67 Mill St. Access Road A & Mill Street

2029 Future Bkgd Traffic Volumes
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	152	51	9	93	30	5
Future Volume (Veh/h)	152	51	9	93	30	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	165	55	10	101	33	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			220		314	192
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			220		314	192
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	99
cM capacity (veh/h)			1349		674	849
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	220	111	38			
Volume Left	0	10	33			
Volume Right	55	0	5			
cSH	1700	1349	693			
Volume to Capacity	0.13	0.01	0.05			
Queue Length 95th (m)	0.0	0.2	1.4			
Control Delay (s)	0.0	0.7	10.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			22.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
21: Mill Street & 112 Mill St. Access Road A

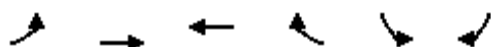
2029 Future Bkgd Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	151	98	1	1	4
Future Volume (Veh/h)	6	151	98	1	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	164	107	1	1	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	108				286	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	108				286	108
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1483				701	946
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	171	108	5			
Volume Left	7	0	1			
Volume Right	0	1	4			
cSH	1483	1700	885			
Volume to Capacity	0.00	0.06	0.01			
Queue Length 95th (m)	0.1	0.0	0.1			
Control Delay (s)	0.3	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			22.8%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
25: Mill Street & 112 Mill St. Access Road B

2029 Future Bkgd Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	23	128	86	4	2	13
Future Volume (Veh/h)	23	128	86	4	2	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	139	93	4	2	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	97				284	95
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	97				284	95
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	99
cM capacity (veh/h)	1496				694	962
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	164	97	16			
Volume Left	25	0	2			
Volume Right	0	4	14			
cSH	1496	1700	918			
Volume to Capacity	0.02	0.06	0.02			
Queue Length 95th (m)	0.4	0.0	0.4			
Control Delay (s)	1.3	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	1.3	0.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			24.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

2029 Future Bkgd Traffic Volumes

28: 67 Mill St. Access Road B/112 Mill St. Access Road C & Mill Street

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	18	77	14	24	6	45	0	8	4	0	21
Future Volume (Veh/h)	35	18	77	14	24	6	45	0	8	4	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	20	84	15	26	7	49	0	9	4	0	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	33			104			220	201	62	206	240	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	33			104			220	201	62	206	240	30
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			93	100	99	99	100	98
cM capacity (veh/h)	1579			1488			701	671	1003	725	639	1045
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	142	48	58	27								
Volume Left	38	15	49	4								
Volume Right	84	7	9	23								
cSH	1579	1488	735	981								
Volume to Capacity	0.02	0.01	0.08	0.03								
Queue Length 95th (m)	0.6	0.2	2.0	0.7								
Control Delay (s)	2.1	2.4	10.3	8.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	2.1	2.4	10.3	8.8								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			25.8%	ICU Level of Service				A				
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

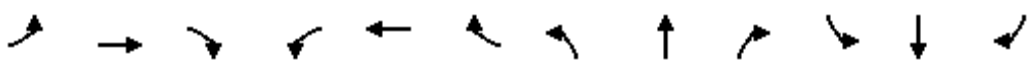
2034 Future Background Traffic Volumes
PM Peak hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	619	187	31	443	42	159	90	36	54	89	71
Future Volume (vph)	116	619	187	31	443	42	159	90	36	54	89	71
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			1.00		0.98	0.99			0.98	
Frt		0.966			0.986			0.964			0.953	
Flt Protected	0.950			0.950			0.950				0.987	
Satd. Flow (prot)	1662	1618	0	1662	1551	0	1568	1629	0	0	1550	0
Flt Permitted	0.332			0.094			0.437				0.855	
Satd. Flow (perm)	579	1618	0	164	1551	0	708	1629	0	0	1341	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			6			16			22	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Peak Hour Factor	0.87	0.89	0.92	0.72	0.87	0.81	0.89	0.71	0.89	0.83	0.94	0.84
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Adj. Flow (vph)	133	696	203	43	509	52	179	127	40	65	95	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	133	899	0	43	561	0	179	167	0	0	245	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Background Traffic Volumes

PM Peak hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.2	60.2		60.2	60.2		40.3	36.8			23.1	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.37	0.34			0.21	
v/c Ratio	0.42	1.00		0.48	0.66		0.52	0.30			0.82	
Control Delay	21.7	57.2		40.7	23.4		30.1	25.0			58.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	21.7	57.2		40.7	23.4		30.1	25.0			58.5	
LOS	C	E		D	C		C	C			E	
Approach Delay		52.6			24.6			27.6			58.5	
Approach LOS		D			C			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 109.6

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 41.8

Intersection LOS: D

Intersection Capacity Utilization 108.7%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7

 Ø2	 Ø3	 Ø4
66 s	14 s	40 s
 Ø6	 Ø8	
66 s	54 s	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Background Traffic Volumes
PM Peak hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	133	899	43	561	179	167	245
v/c Ratio	0.42	1.00	0.48	0.66	0.52	0.30	0.82
Control Delay	21.7	57.2	40.7	23.4	30.1	25.0	58.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	57.2	40.7	23.4	30.1	25.0	58.5
Queue Length 50th (m)	16.8	~197.3	5.7	84.6	28.3	24.6	48.4
Queue Length 95th (m)	38.4	#325.6	15.8	141.7	45.1	30.9	77.9
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	318	896	90	854	346	720	428
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	1.00	0.48	0.66	0.52	0.23	0.57
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.							

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Background Traffic Volumes

PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	619	187	31	443	42	159	90	36	54	89	71
Future Volume (vph)	116	619	187	31	443	42	159	90	36	54	89	71
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1656	1619		1662	1551		1557	1629			1551	
Flt Permitted	0.33	1.00		0.09	1.00		0.44	1.00			0.85	
Satd. Flow (perm)	578	1619		165	1551		716	1629			1343	
Peak-hour factor, PHF	0.87	0.89	0.92	0.72	0.87	0.81	0.89	0.71	0.89	0.83	0.94	0.84
Adj. Flow (vph)	133	696	203	43	509	52	179	127	40	65	95	85
RTOR Reduction (vph)	0	8	0	0	3	0	0	11	0	0	17	0
Lane Group Flow (vph)	133	891	0	43	558	0	179	156	0	0	228	0
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.2	60.2		60.2	60.2		36.8	36.8			23.1	
Effective Green, g (s)	60.2	60.2		60.2	60.2		36.8	36.8			23.1	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.34	0.34			0.21	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	317	890		90	852		322	547			283	
v/s Ratio Prot		c0.55			0.36		c0.05	0.10				
v/s Ratio Perm	0.23			0.26			0.13				c0.17	
v/c Ratio	0.42	1.00		0.48	0.66		0.56	0.29			0.80	
Uniform Delay, d1	14.4	24.6		15.1	17.3		28.3	26.7			41.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	4.0	30.5		17.1	3.9		2.1	0.3			15.2	
Delay (s)	18.5	55.2		32.1	21.3		30.4	27.0			56.2	
Level of Service	B	E		C	C		C	C			E	
Approach Delay (s)		50.5			22.0			28.8			56.2	
Approach LOS		D			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			40.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			109.5			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			108.7%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2034 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	28	668	7	6	567
Future Volume (Veh/h)	11	28	668	7	6	567
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91
Hourly flow rate (vph)	12	30	751	8	7	623
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1392	755			759	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1392	755			759	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	93			99	
cM capacity (veh/h)	157	412			862	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	42	759	630			
Volume Left	12	0	7			
Volume Right	30	8	0			
cSH	281	1700	862			
Volume to Capacity	0.15	0.45	0.01			
Queue Length 95th (m)	4.1	0.0	0.2			
Control Delay (s)	20.0	0.0	0.2			
Lane LOS	C		A			
Approach Delay (s)	20.0	0.0	0.2			
Approach LOS	C					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		48.6%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2034 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	19	31	7	11	14
Future Volume (Veh/h)	11	19	31	7	11	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	21	34	8	12	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96	20	27			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	20	27			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	98	98			
cM capacity (veh/h)	885	1058	1587			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	33	42	27			
Volume Left	12	34	0			
Volume Right	21	0	15			
cSH	988	1587	1700			
Volume to Capacity	0.03	0.02	0.02			
Queue Length 95th (m)	0.8	0.5	0.0			
Control Delay (s)	8.8	6.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	6.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization		18.8%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street & Mill Street

2034 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	31	6	55	68	10	172
Future Volume (Veh/h)	31	6	55	68	10	172
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	7	60	74	11	187
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			41		232	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			41		232	38
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	82
cM capacity (veh/h)			1568		728	1035
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	41	134	198			
Volume Left	0	60	11			
Volume Right	7	0	187			
cSH	1700	1568	1011			
Volume to Capacity	0.02	0.04	0.20			
Queue Length 95th (m)	0.0	1.0	5.8			
Control Delay (s)	0.0	3.5	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.5	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			31.1%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2034 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	29	646	36	52	526
Future Volume (Veh/h)	17	29	646	36	52	526
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91
Hourly flow rate (vph)	18	32	726	40	57	578
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (m)			376			
pX, platoon unblocked	0.61	0.61			0.61	
vC, conflicting volume	1438	746			766	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1398	254			287	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	93			93	
cM capacity (veh/h)	87	475			772	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	50	766	38	597		
Volume Left	18	0	38	19		
Volume Right	32	40	0	0		
cSH	182	1700	772	772		
Volume to Capacity	0.27	0.45	0.07	0.07		
Queue Length 95th (m)	8.5	0.0	1.9	1.9		
Control Delay (s)	32.0	0.0	10.0	1.4		
Lane LOS	D		B	A		
Approach Delay (s)	32.0	0.0	1.9			
Approach LOS	D					
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			49.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2034 Future Background Traffic Volumes

PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	13	0	12	0	669	56	9	534	0
Future Volume (Veh/h)	0	0	0	13	0	12	0	669	56	9	534	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	0	0	0	14	0	13	0	752	63	10	587	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked	0.51	0.51		0.51	0.51	0.51				0.51		
vC, conflicting volume	1404	1422	587	1390	1390	784	587			815		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1311	1347	587	1285	1285	96	587			158		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	80	100	97	100			99		
cM capacity (veh/h)	67	76	510	71	83	490	988			726		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	27	815	10	587							
Volume Left	0	14	0	10	0							
Volume Right	0	13	63	0	0							
cSH	1700	121	988	726	1700							
Volume to Capacity	0.00	0.22	0.00	0.01	0.35							
Queue Length 95th (m)	0.0	6.4	0.0	0.3	0.0							
Control Delay (s)	0.0	43.0	0.0	10.0	0.0							
Lane LOS	A	E		B								
Approach Delay (s)	0.0	43.0	0.0	0.2								
Approach LOS	A	E										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			51.9%		ICU Level of Service					A		
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2034 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	117	160	33	133	178
Future Volume (Veh/h)	40	117	160	33	133	178
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	127	174	36	145	193
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	675	192			174	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675	192			174	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	85			90	
cM capacity (veh/h)	376	850			1403	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	170	210	338			
Volume Left	43	0	145			
Volume Right	127	36	0			
cSH	644	1700	1403			
Volume to Capacity	0.26	0.12	0.10			
Queue Length 95th (m)	8.5	0.0	2.8			
Control Delay (s)	12.6	0.0	3.9			
Lane LOS	B		A			
Approach Delay (s)	12.6	0.0	3.9			
Approach LOS	B					
Intersection Summary						
Average Delay		4.8				
Intersection Capacity Utilization		46.6%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2034 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	38	688	19	35	513
Future Volume (Veh/h)	3	38	688	19	35	513
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91
Hourly flow rate (vph)	3	41	773	21	38	564
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			169			
pX, platoon unblocked	0.50	0.50			0.50	
vC, conflicting volume	1424	784			794	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1347	66			87	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			95	
cM capacity (veh/h)	79	498			754	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	44	794	602			
Volume Left	3	0	38			
Volume Right	41	21	0			
cSH	366	1700	754			
Volume to Capacity	0.12	0.47	0.05			
Queue Length 95th (m)	3.2	0.0	1.3			
Control Delay (s)	16.2	0.0	1.3			
Lane LOS	C		A			
Approach Delay (s)	16.2	0.0	1.3			
Approach LOS	C					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			70.5%	ICU Level of Service		C
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2034 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	19	175	19	35	184
Future Volume (Veh/h)	20	19	175	19	35	184
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	21	190	21	38	200
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	476	200			211	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	476	200			211	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			97	
cM capacity (veh/h)	532	840			1360	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	43	211	238			
Volume Left	22	0	38			
Volume Right	21	21	0			
cSH	648	1700	1360			
Volume to Capacity	0.07	0.12	0.03			
Queue Length 95th (m)	1.7	0.0	0.7			
Control Delay (s)	10.9	0.0	1.4			
Lane LOS	B		A			
Approach Delay (s)	10.9	0.0	1.4			
Approach LOS	B					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			35.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2034 Future Background Traffic Volumes
PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	6	3	37	10	66	6	121	43	71	112	19
Future Volume (vph)	11	6	3	37	10	66	6	121	43	71	112	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	7	3	40	11	72	7	132	47	77	122	21
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	22	123	186	220								
Volume Left (vph)	12	40	7	77								
Volume Right (vph)	3	72	47	21								
Hadj (s)	0.06	-0.25	-0.11	0.05								
Departure Headway (s)	5.1	4.6	4.4	4.5								
Degree Utilization, x	0.03	0.16	0.23	0.28								
Capacity (veh/h)	638	715	782	762								
Control Delay (s)	8.2	8.5	8.7	9.2								
Approach Delay (s)	8.2	8.5	8.7	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	8.8											
Level of Service	A											
Intersection Capacity Utilization	37.4%			ICU Level of Service					A			
Analysis Period (min)	15											

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2034 Future Background Traffic Volumes

PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	117	3	2	100	21	1	0	1	9	1	12
Future Volume (Veh/h)	16	117	3	2	100	21	1	0	1	9	1	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	127	3	2	109	23	1	0	1	10	1	13
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	132			130			300	298	128	288	288	120
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	132			130			300	298	128	288	288	120
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	98	100	99
cM capacity (veh/h)	1453			1455			635	606	921	657	613	931
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	147	134	2	24								
Volume Left	17	2	1	10								
Volume Right	3	23	1	13								
cSH	1453	1455	752	779								
Volume to Capacity	0.01	0.00	0.00	0.03								
Queue Length 95th (m)	0.3	0.0	0.1	0.8								
Control Delay (s)	1.0	0.1	9.8	9.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.0	0.1	9.8	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			25.7%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2034 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	623	9	16	560	6	12
Future Volume (Veh/h)	623	9	16	560	6	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.91	0.91	0.50	0.50
Hourly flow rate (vph)	670	10	18	615	12	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			680		1326	675
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			680		1326	675
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		93	95
cM capacity (veh/h)			912		168	454
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	680	633	36			
Volume Left	0	18	12			
Volume Right	10	0	24			
cSH	1700	912	290			
Volume to Capacity	0.40	0.02	0.12			
Queue Length 95th (m)	0.0	0.5	3.4			
Control Delay (s)	0.0	0.5	19.2			
Lane LOS		A	C			
Approach Delay (s)	0.0	0.5	19.2			
Approach LOS			C			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			56.0%	ICU Level of Service		B
Analysis Period (min)			15			

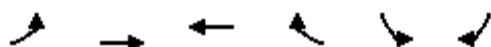
Norwood-Upper Mill Pond Development
8: 67 Mill St. Access Road A & Mill Street

2034 Future Bkgd Traffic Volumes
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	152	51	9	93	30	5
Future Volume (Veh/h)	152	51	9	93	30	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	165	55	10	101	33	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			220		314	192
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			220		314	192
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	99
cM capacity (veh/h)			1349		674	849
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	220	111	38			
Volume Left	0	10	33			
Volume Right	55	0	5			
cSH	1700	1349	693			
Volume to Capacity	0.13	0.01	0.05			
Queue Length 95th (m)	0.0	0.2	1.4			
Control Delay (s)	0.0	0.7	10.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			22.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
21: Mill Street & 112 Mill St. Access Road A

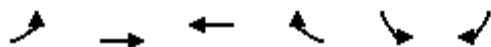
2034 Future Bkgd Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	6	151	98	1	1	4
Future Volume (Veh/h)	6	151	98	1	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	164	107	1	1	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	108				286	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	108				286	108
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1483				701	946
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	171	108	5			
Volume Left	7	0	1			
Volume Right	0	1	4			
cSH	1483	1700	885			
Volume to Capacity	0.00	0.06	0.01			
Queue Length 95th (m)	0.1	0.0	0.1			
Control Delay (s)	0.3	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			22.8%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
25: Mill Street & 112 Mill St. Access Road B

2034 Future Bkgd Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	129	86	4	2	13
Future Volume (Veh/h)	23	129	86	4	2	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	140	93	4	2	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	97				285	95
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	97				285	95
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	99
cM capacity (veh/h)	1496				693	962
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	165	97	16			
Volume Left	25	0	2			
Volume Right	0	4	14			
cSH	1496	1700	917			
Volume to Capacity	0.02	0.06	0.02			
Queue Length 95th (m)	0.4	0.0	0.4			
Control Delay (s)	1.2	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	1.2	0.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			24.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

2034 Future Bkgd Traffic Volumes

28: 67 Mill St. Access Road B/112 Mill St. Access Road C & Mill Street

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	18	77	14	24	6	45	0	8	4	0	21
Future Volume (Veh/h)	35	18	77	14	24	6	45	0	8	4	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	20	84	15	26	7	49	0	9	4	0	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	33			104			220	201	62	206	240	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	33			104			220	201	62	206	240	30
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			93	100	99	99	100	98
cM capacity (veh/h)	1579			1488			701	671	1003	725	639	1045
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	142	48	58	27								
Volume Left	38	15	49	4								
Volume Right	84	7	9	23								
cSH	1579	1488	735	981								
Volume to Capacity	0.02	0.01	0.08	0.03								
Queue Length 95th (m)	0.6	0.2	2.0	0.7								
Control Delay (s)	2.1	2.4	10.3	8.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	2.1	2.4	10.3	8.8								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			25.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

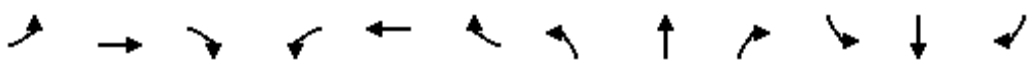
2039 Future Background Traffic Volumes
PM Peak hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	647	194	33	464	44	164	94	38	57	93	73
Future Volume (vph)	120	647	194	33	464	44	164	94	38	57	93	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			1.00		0.98	0.99			0.98	
Frt		0.966			0.986			0.963			0.954	
Flt Protected	0.950			0.950			0.950				0.987	
Satd. Flow (prot)	1662	1618	0	1662	1551	0	1568	1627	0	0	1552	0
Flt Permitted	0.309			0.066			0.435				0.849	
Satd. Flow (perm)	539	1618	0	116	1551	0	705	1627	0	0	1334	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			6			16			22	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Peak Hour Factor	0.87	0.89	0.92	0.72	0.87	0.81	0.89	0.71	0.89	0.83	0.94	0.84
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Adj. Flow (vph)	138	727	211	46	533	54	184	132	43	69	99	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	938	0	46	587	0	184	175	0	0	255	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Background Traffic Volumes

PM Peak hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.2	60.2		60.2	60.2		41.2	37.8			24.0	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.37	0.34			0.22	
v/c Ratio	0.47	1.06		0.73	0.69		0.53	0.31			0.83	
Control Delay	24.2	72.5		85.6	25.2		30.2	25.1			60.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	24.2	72.5		85.6	25.2		30.2	25.1			60.0	
LOS	C	E		F	C		C	C			E	
Approach Delay		66.3			29.6			27.8			60.0	
Approach LOS		E			C			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 110.5

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 49.7

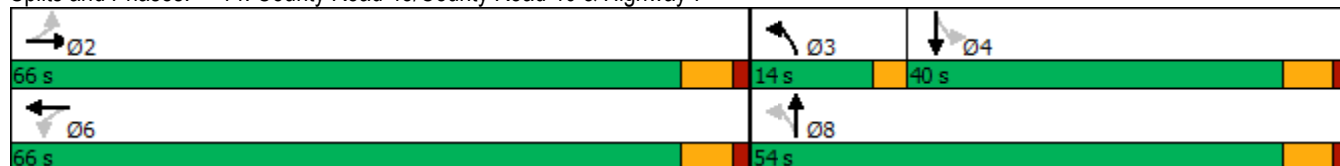
Intersection LOS: D

Intersection Capacity Utilization 111.4%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Background Traffic Volumes
PM Peak hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	138	938	46	587	184	175	255
v/c Ratio	0.47	1.06	0.73	0.69	0.53	0.31	0.83
Control Delay	24.2	72.5	85.6	25.2	30.2	25.1	60.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	72.5	85.6	25.2	30.2	25.1	60.0
Queue Length 50th (m)	18.6	~234.9	7.6	93.4	29.2	26.1	51.1
Queue Length 95th (m)	42.1	#346.6	#24.8	152.0	46.1	32.4	82.0
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	293	888	63	847	348	713	422
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	1.06	0.73	0.69	0.53	0.25	0.60
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.							

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Background Traffic Volumes
PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	647	194	33	464	44	164	94	38	57	93	73
Future Volume (vph)	120	647	194	33	464	44	164	94	38	57	93	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1656	1619		1662	1552		1558	1627			1552	
Flt Permitted	0.31	1.00		0.07	1.00		0.43	1.00			0.85	
Satd. Flow (perm)	539	1619		116	1552		713	1627			1336	
Peak-hour factor, PHF	0.87	0.89	0.92	0.72	0.87	0.81	0.89	0.71	0.89	0.83	0.94	0.84
Adj. Flow (vph)	138	727	211	46	533	54	184	132	43	69	99	87
RTOR Reduction (vph)	0	8	0	0	3	0	0	11	0	0	17	0
Lane Group Flow (vph)	138	930	0	46	584	0	184	164	0	0	238	0
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.2	60.2		60.2	60.2		37.7	37.7			24.0	
Effective Green, g (s)	60.2	60.2		60.2	60.2		37.7	37.7			24.0	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.34	0.34			0.22	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	293	882		63	846		325	555			290	
v/s Ratio Prot		c0.57			0.38		c0.05	0.10				
v/s Ratio Perm	0.26			0.40			0.14				c0.18	
v/c Ratio	0.47	1.05		0.73	0.69		0.57	0.30			0.82	
Uniform Delay, d1	15.4	25.1		19.0	18.3		28.3	26.6			41.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	5.3	45.8		53.6	4.6		2.3	0.3			16.4	
Delay (s)	20.7	70.9		72.6	22.9		30.5	26.9			57.5	
Level of Service	C	E		E	C		C	C			E	
Approach Delay (s)		64.4			26.5			28.8			57.5	
Approach LOS		E			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			47.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			110.4			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			111.4%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2039 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	28	702	7	6	594
Future Volume (Veh/h)	12	28	702	7	6	594
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91
Hourly flow rate (vph)	13	30	789	8	7	653
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1460	793			797	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1460	793			797	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	92			99	
cM capacity (veh/h)	142	392			834	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	43	797	660			
Volume Left	13	0	7			
Volume Right	30	8	0			
cSH	256	1700	834			
Volume to Capacity	0.17	0.47	0.01			
Queue Length 95th (m)	4.7	0.0	0.2			
Control Delay (s)	21.9	0.0	0.2			
Lane LOS	C		A			
Approach Delay (s)	21.9	0.0	0.2			
Approach LOS	C					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		50.6%		ICU Level of Service	A	
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2039 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	19	31	7	12	14
Future Volume (Veh/h)	11	19	31	7	12	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	21	34	8	13	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96	20	28			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	20	28			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	98	98			
cM capacity (veh/h)	883	1057	1585			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	33	42	28			
Volume Left	12	34	0			
Volume Right	21	0	15			
cSH	987	1585	1700			
Volume to Capacity	0.03	0.02	0.02			
Queue Length 95th (m)	0.8	0.5	0.0			
Control Delay (s)	8.8	6.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	6.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			18.8%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street & Mill Street

2039 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	31	6	56	68	11	173
Future Volume (Veh/h)	31	6	56	68	11	173
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	7	61	74	12	188
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			41		234	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			41		234	38
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	82
cM capacity (veh/h)			1568		725	1035
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	41	135	200			
Volume Left	0	61	12			
Volume Right	7	0	188			
cSH	1700	1568	1009			
Volume to Capacity	0.02	0.04	0.20			
Queue Length 95th (m)	0.0	1.0	5.9			
Control Delay (s)	0.0	3.5	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.5	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			31.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2039 Future Background Traffic Volumes
PM Peak hour

											
Movement	WBL	WBR	NBT	NBR	SBL	SBT					
Lane Configurations											
Traffic Volume (veh/h)	17	30	678	37	53	552					
Future Volume (Veh/h)	17	30	678	37	53	552					
Sign Control	Stop		Free			Free					
Grade	0%		0%			0%					
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91					
Hourly flow rate (vph)	18	33	762	42	58	607					
Pedestrians											
Lane Width (m)											
Walking Speed (m/s)											
Percent Blockage											
Right turn flare (veh)											
Median type			None		None						
Median storage veh											
Upstream signal (m)			376								
pX, platoon unblocked	0.58	0.58			0.58						
vC, conflicting volume	1506	783			804						
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	1510	263			299						
tC, single (s)	6.4	6.2			4.1						
tC, 2 stage (s)											
tF (s)	3.5	3.3			2.2						
p0 queue free %	75	93			92						
cM capacity (veh/h)	71	450			731						
Direction, Lane #	WB 1	NB 1	SB 1	SB 2							
Volume Total	51	804	39	626							
Volume Left	18	0	39	19							
Volume Right	33	42	0	0							
cSH	155	1700	731	731							
Volume to Capacity	0.33	0.47	0.08	0.08							
Queue Length 95th (m)	10.6	0.0	2.1	2.1							
Control Delay (s)	39.1	0.0	10.3	1.6							
Lane LOS	E		B	A							
Approach Delay (s)	39.1	0.0	2.1								
Approach LOS	E										
Intersection Summary											
Average Delay			2.2								
Intersection Capacity Utilization			51.2%	ICU Level of Service	A						
Analysis Period (min)			15								

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2039 Future Background Traffic Volumes

PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	13	0	13	0	702	57	9	560	0
Future Volume (Veh/h)	0	0	0	13	0	13	0	702	57	9	560	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.89	0.89	0.89	0.91	0.91	0.91
Hourly flow rate (vph)	0	0	0	14	0	14	0	789	64	10	615	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked	0.50	0.50		0.50	0.50	0.50				0.50		
vC, conflicting volume	1470	1488	615	1456	1456	821	615			853		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1441	1476	615	1413	1413	154	615			218		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	76	100	97	100			99		
cM capacity (veh/h)	53	63	491	58	69	450	965			682		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	28	853	10	615							
Volume Left	0	14	0	10	0							
Volume Right	0	14	64	0	0							
cSH	1700	102	965	682	1700							
Volume to Capacity	0.00	0.27	0.00	0.01	0.36							
Queue Length 95th (m)	0.0	8.2	0.0	0.4	0.0							
Control Delay (s)	0.0	53.1	0.0	10.4	0.0							
Lane LOS	A	F		B								
Approach Delay (s)	0.0	53.1	0.0	0.2								
Approach LOS	A	F										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			53.9%			ICU Level of Service			A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2039 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	42	119	168	35	136	187
Future Volume (Veh/h)	42	119	168	35	136	187
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	129	183	38	148	203
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	701	202			183	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	701	202			183	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	85			89	
cM capacity (veh/h)	362	839			1392	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	175	221	351			
Volume Left	46	0	148			
Volume Right	129	38	0			
cSH	623	1700	1392			
Volume to Capacity	0.28	0.13	0.11			
Queue Length 95th (m)	9.2	0.0	2.8			
Control Delay (s)	13.0	0.0	3.9			
Lane LOS	B		A			
Approach Delay (s)	13.0	0.0	3.9			
Approach LOS	B					
Intersection Summary						
Average Delay		4.9				
Intersection Capacity Utilization		48.0%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2039 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	40	719	20	36	537
Future Volume (Veh/h)	4	40	719	20	36	537
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.89	0.89	0.91	0.91
Hourly flow rate (vph)	4	43	808	22	40	590
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			169			
pX, platoon unblocked	0.50	0.50			0.50	
vC, conflicting volume	1489	819			830	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1478	126			149	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	91			94	
cM capacity (veh/h)	65	458			710	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	47	830	630			
Volume Left	4	0	40			
Volume Right	43	22	0			
cSH	302	1700	710			
Volume to Capacity	0.16	0.49	0.06			
Queue Length 95th (m)	4.3	0.0	1.4			
Control Delay (s)	19.1	0.0	1.5			
Lane LOS	C		A			
Approach Delay (s)	19.1	0.0	1.5			
Approach LOS	C					
Intersection Summary						
Average Delay		1.2				
Intersection Capacity Utilization		72.8%		ICU Level of Service		C
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2039 Future Background Traffic Volumes
PM Peak hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	21	20	183	20	36	193
Future Volume (Veh/h)	21	20	183	20	36	193
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	22	199	22	39	210
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	498	210			221	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	498	210			221	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	97			97	
cM capacity (veh/h)	516	830			1348	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	45	221	249			
Volume Left	23	0	39			
Volume Right	22	22	0			
cSH	633	1700	1348			
Volume to Capacity	0.07	0.13	0.03			
Queue Length 95th (m)	1.8	0.0	0.7			
Control Delay (s)	11.1	0.0	1.4			
Lane LOS	B		A			
Approach Delay (s)	11.1	0.0	1.4			
Approach LOS	B					
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		36.3%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2039 Future Background Traffic Volumes
PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	6	4	38	11	69	6	127	44	75	117	20
Future Volume (vph)	12	6	4	38	11	69	6	127	44	75	117	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	7	4	41	12	75	7	138	48	82	127	22
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	24	128	193	231								
Volume Left (vph)	13	41	7	82								
Volume Right (vph)	4	75	48	22								
Hadj (s)	0.04	-0.25	-0.11	0.05								
Departure Headway (s)	5.1	4.7	4.4	4.5								
Degree Utilization, x	0.03	0.17	0.24	0.29								
Capacity (veh/h)	630	706	775	756								
Control Delay (s)	8.3	8.6	8.8	9.4								
Approach Delay (s)	8.3	8.6	8.8	9.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			38.7%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2039 Future Background Traffic Volumes

PM Peak hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	123	4	2	106	22	1	0	1	9	1	13
Future Volume (Veh/h)	16	123	4	2	106	22	1	0	1	9	1	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	134	4	2	115	24	1	0	1	10	1	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	139			138			316	313	136	302	303	127
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	139			138			316	313	136	302	303	127
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	98	100	98
cM capacity (veh/h)	1445			1446			620	594	913	643	602	923
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	155	141	2	25								
Volume Left	17	2	1	10								
Volume Right	4	24	1	14								
cSH	1445	1446	739	772								
Volume to Capacity	0.01	0.00	0.00	0.03								
Queue Length 95th (m)	0.3	0.0	0.1	0.8								
Control Delay (s)	0.9	0.1	9.9	9.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.9	0.1	9.9	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			26.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2039 Future Background Traffic Volumes
PM Peak hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	654	9	16	587	6	13
Future Volume (Veh/h)	654	9	16	587	6	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.91	0.91	0.50	0.50
Hourly flow rate (vph)	703	10	18	645	12	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			713	1389		708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			713	1389		708
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			98	92		94
cM capacity (veh/h)			887	154		435
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	713	663	38			
Volume Left	0	18	12			
Volume Right	10	0	26			
cSH	1700	887	276			
Volume to Capacity	0.42	0.02	0.14			
Queue Length 95th (m)	0.0	0.5	3.8			
Control Delay (s)	0.0	0.5	20.1			
Lane LOS	A		C			
Approach Delay (s)	0.0	0.5	20.1			
Approach LOS			C			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			57.5%	ICU Level of Service		B
Analysis Period (min)			15			

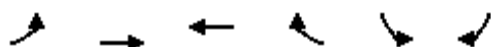
Norwood-Upper Mill Pond Development
8: 67 Mill St. Access Road A & Mill Street

2039 Future Bkgd Traffic Volumes
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	153	51	9	94	30	5
Future Volume (Veh/h)	153	51	9	94	30	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	166	55	10	102	33	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			221		316	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			221		316	194
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	99
cM capacity (veh/h)			1348		672	848
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	221	112	38			
Volume Left	0	10	33			
Volume Right	55	0	5			
cSH	1700	1348	691			
Volume to Capacity	0.13	0.01	0.05			
Queue Length 95th (m)	0.0	0.2	1.4			
Control Delay (s)	0.0	0.7	10.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			22.4%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
21: Mill Street & 112 Mill St. Access Road A

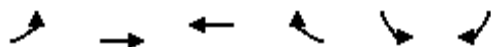
2039 Future Bkgd Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	6	152	99	1	1	4
Future Volume (Veh/h)	6	152	99	1	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	165	108	1	1	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	109				288	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	109				288	108
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1481				700	945
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	172	109	5			
Volume Left	7	0	1			
Volume Right	0	1	4			
cSH	1481	1700	883			
Volume to Capacity	0.00	0.06	0.01			
Queue Length 95th (m)	0.1	0.0	0.1			
Control Delay (s)	0.3	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			22.9%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
25: Mill Street & 112 Mill St. Access Road B

2039 Future Bkgd Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	129	87	4	2	13
Future Volume (Veh/h)	23	129	87	4	2	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	140	95	4	2	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	99				287	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	99				287	97
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	99
cM capacity (veh/h)	1494				692	959
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	165	99	16			
Volume Left	25	0	2			
Volume Right	0	4	14			
cSH	1494	1700	915			
Volume to Capacity	0.02	0.06	0.02			
Queue Length 95th (m)	0.4	0.0	0.4			
Control Delay (s)	1.2	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	1.2	0.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			24.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

2039 Future Bkgd Traffic Volumes

28: 67 Mill St. Access Road B/112 Mill St. Access Road C & Mill Street

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	19	77	14	25	6	45	0	8	4	0	21
Future Volume (Veh/h)	35	19	77	14	25	6	45	0	8	4	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	21	84	15	27	7	49	0	9	4	0	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	34			105			222	203	63	208	242	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	34			105			222	203	63	208	242	30
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			93	100	99	99	100	98
cM capacity (veh/h)	1578			1486			699	670	1002	723	638	1044
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	143	49	58	27								
Volume Left	38	15	49	4								
Volume Right	84	7	9	23								
cSH	1578	1486	733	979								
Volume to Capacity	0.02	0.01	0.08	0.03								
Queue Length 95th (m)	0.6	0.2	2.1	0.7								
Control Delay (s)	2.1	2.3	10.3	8.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	2.1	2.3	10.3	8.8								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			25.9%		ICU Level of Service				A			
Analysis Period (min)			15									

TOTAL TRAFFIC CONDITIONS

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Total Traffic Volumes
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	313	121	23	416	16	296	72	29	34	75	87
Future Volume (vph)	32	313	121	23	416	16	296	72	29	34	75	87
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.98		0.98	1.00		0.98	0.99			0.97	
Frt		0.958			0.995			0.956			0.940	
Flt Protected	0.950			0.950			0.950				0.991	
Satd. Flow (prot)	1397	1424	0	1458	1568	0	1599	1627	0	0	1541	0
Flt Permitted	0.413			0.411			0.400				0.919	
Satd. Flow (perm)	604	1424	0	621	1568	0	659	1627	0	0	1423	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			2			20			33	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Adj. Flow (vph)	35	340	132	25	452	17	322	78	32	37	82	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	472	0	25	469	0	322	110	0	0	214	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Total Traffic Volumes
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		36.1	32.7			18.6	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.34	0.31			0.18	
v/c Ratio	0.10	0.57		0.07	0.52		0.99	0.21			0.77	
Control Delay	13.2	18.3		12.8	17.6		80.8	22.2			52.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	13.2	18.3		12.8	17.6		80.8	22.2			52.7	
LOS	B	B		B	B		F	C			D	
Approach Delay		17.9			17.3			65.9			52.7	
Approach LOS		B			B			E			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 105.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 34.8

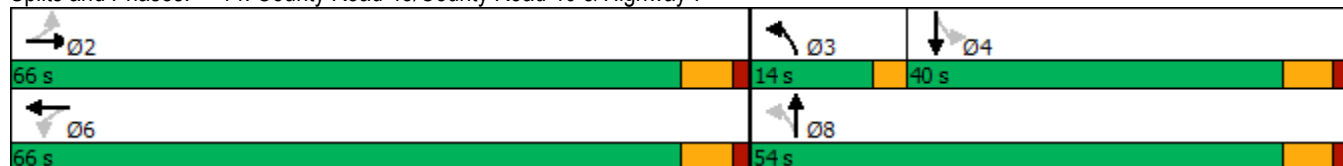
Intersection LOS: C

Intersection Capacity Utilization 75.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Total Traffic Volumes
AM Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	35	472	25	469	322	110	214
v/c Ratio	0.10	0.57	0.07	0.52	0.99	0.21	0.77
Control Delay	13.2	18.3	12.8	17.6	80.8	22.2	52.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	18.3	12.8	17.6	80.8	22.2	52.7
Queue Length 50th (m)	3.2	58.0	2.3	57.9	56.4	14.1	37.6
Queue Length 95th (m)	10.1	108.7	7.7	104.7	#112.7	27.4	63.8
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	344	822	354	895	324	748	477
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.57	0.07	0.52	0.99	0.15	0.45

Intersection Summary

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

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	313	121	23	416	16	296	72	29	34	75	87
Future Volume (vph)	32	313	121	23	416	16	296	72	29	34	75	87
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99			0.97	
Flpb, ped/bikes	0.99	1.00		0.98	1.00		0.99	1.00			1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.96			0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1390	1427		1435	1568		1588	1629			1540	
Flt Permitted	0.41	1.00		0.41	1.00		0.40	1.00			0.92	
Satd. Flow (perm)	605	1427		621	1568		669	1629			1428	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	340	132	25	452	17	322	78	32	37	82	95
RTOR Reduction (vph)	0	10	0	0	1	0	0	14	0	0	27	0
Lane Group Flow (vph)	35	462	0	25	468	0	322	96	0	0	187	0
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		32.7	32.7			18.7	
Effective Green, g (s)	60.1	60.1		60.1	60.1		32.7	32.7			18.7	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.31	0.31			0.18	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	345	814		354	894		303	505			253	
v/s Ratio Prot		c0.32			0.30		c0.11	0.06				
v/s Ratio Perm	0.06			0.04			c0.22				0.13	
v/c Ratio	0.10	0.57		0.07	0.52		1.06	0.19			0.74	
Uniform Delay, d1	10.3	14.4		10.1	13.8		35.7	26.6			41.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.6	2.9		0.4	2.2		69.2	0.2			10.7	
Delay (s)	10.9	17.2		10.5	16.0		105.0	26.8			51.7	
Level of Service	B	B		B	B		F	C			D	
Approach Delay (s)		16.8			15.7			85.1			51.7	
Approach LOS		B			B			F			D	
Intersection Summary												
HCM 2000 Control Delay			38.9			HCM 2000 Level of Service					D	
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			105.3			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			75.6%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	73	345	0	0	461
Future Volume (Veh/h)	25	73	345	0	0	461
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	79	375	0	0	501
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	876	375			375	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	876	375			375	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	88			100	
cM capacity (veh/h)	322	676			1195	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	106	375	501			
Volume Left	27	0	0			
Volume Right	79	0	0			
cSH	528	1700	1195			
Volume to Capacity	0.20	0.22	0.00			
Queue Length 95th (m)	5.9	0.0	0.0			
Control Delay (s)	13.5	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.5	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.5				
Intersection Capacity Utilization		38.9%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	40	18	15	24	5
Future Volume (Veh/h)	12	40	18	15	24	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	43	20	16	26	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	84	28	31			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	84	28	31			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	96	99			
cM capacity (veh/h)	905	1046	1582			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	56	36	31			
Volume Left	13	20	0			
Volume Right	43	0	5			
cSH	1010	1582	1700			
Volume to Capacity	0.06	0.01	0.02			
Queue Length 95th (m)	1.4	0.3	0.0			
Control Delay (s)	8.8	4.1	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	4.1	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		5.2				
Intersection Capacity Utilization		18.5%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
7: King Street/Street A & Mill Street

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	2	132	152	3	1	50	87	5	65	52
Future Volume (Veh/h)	5	22	2	132	152	3	1	50	87	5	65	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	24	2	143	165	3	1	54	95	5	71	57
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	168			26			580	489	25	610	488	166
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	168			26			580	489	25	610	488	166
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	88	91	98	84	94
cM capacity (veh/h)	1410			1588			324	435	1051	311	435	878
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	31	311	150	133								
Volume Left	5	143	1	5								
Volume Right	2	3	95	57								
cSH	1410	1588	689	545								
Volume to Capacity	0.00	0.09	0.22	0.24								
Queue Length 95th (m)	0.1	2.4	6.6	7.6								
Control Delay (s)	1.2	3.8	11.7	13.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.2	3.8	11.7	13.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			39.0%	ICU Level of Service					A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	33	13	334	36	42	445
Future Volume (Veh/h)	33	13	334	36	42	445
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	14	363	39	46	484
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh)						
Upstream signal (m)			376			
pX, platoon unblocked						
vC, conflicting volume	958	382			402	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	958	382			402	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	98			96	
cM capacity (veh/h)	274	665			1157	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	50	402	46	484		
Volume Left	36	0	46	0		
Volume Right	14	39	0	0		
cSH	328	1700	1157	1700		
Volume to Capacity	0.15	0.24	0.04	0.28		
Queue Length 95th (m)	4.3	0.0	1.0	0.0		
Control Delay (s)	17.9	0.0	8.2	0.0		
Lane LOS	C		A			
Approach Delay (s)	17.9	0.0	0.7			
Approach LOS	C					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			38.1%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	24	0	13	0	357	35	29	450	0
Future Volume (Veh/h)	0	0	0	24	0	13	0	357	35	29	450	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	26	0	14	0	388	38	32	489	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked												
vC, conflicting volume	974	979	489	960	960	407	489			426		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	974	979	489	960	960	407	489			426		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	89	100	98	100			97		
cM capacity (veh/h)	221	243	579	231	249	644	1074			1133		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	40	426	32	489							
Volume Left	0	26	0	32	0							
Volume Right	0	14	38	0	0							
cSH	1700	298	1074	1133	1700							
Volume to Capacity	0.00	0.13	0.00	0.03	0.29							
Queue Length 95th (m)	0.0	3.7	0.0	0.7	0.0							
Control Delay (s)	0.0	18.9	0.0	8.3	0.0							
Lane LOS	A	C		A								
Approach Delay (s)	0.0	18.9	0.0	0.5								
Approach LOS	A	C										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			36.2%			ICU Level of Service				A		
Analysis Period (min)			15									

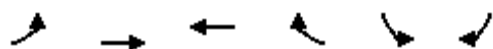
Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	27	265	132	23	90	130
Future Volume (Veh/h)	27	265	132	23	90	130
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	288	143	25	98	141
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	480	143			143	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	480	143			143	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	68			93	
cM capacity (veh/h)	508	905			1440	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	317	143	25	239		
Volume Left	29	0	0	98		
Volume Right	288	0	25	0		
cSH	844	1700	1700	1440		
Volume to Capacity	0.38	0.08	0.01	0.07		
Queue Length 95th (m)	14.1	0.0	0.0	1.8		
Control Delay (s)	11.8	0.0	0.0	3.5		
Lane LOS	B			A		
Approach Delay (s)	11.8	0.0		3.5		
Approach LOS	B					
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			46.6%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
20: Mill Street & Street C

2029 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	75	182	4	10	106
Future Volume (Veh/h)	32	75	182	4	10	106
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	82	198	4	11	115
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	202				352	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	202				352	200
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				98	86
cM capacity (veh/h)	1370				629	841
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	117	202	126			
Volume Left	35	0	11			
Volume Right	0	4	115			
cSH	1370	1700	817			
Volume to Capacity	0.03	0.12	0.15			
Queue Length 95th (m)	0.6	0.0	4.3			
Control Delay (s)	2.4	0.0	10.2			
Lane LOS	A		B			
Approach Delay (s)	2.4	0.0	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			32.6%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	27	365	11	27	447
Future Volume (Veh/h)	8	27	365	11	27	447
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	29	397	12	29	486
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			169			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	947	403			409	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	902	314			320	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	96			97	
cM capacity (veh/h)	278	672			1146	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	38	409	515			
Volume Left	9	0	29			
Volume Right	29	12	0			
cSH	503	1700	1146			
Volume to Capacity	0.08	0.24	0.03			
Queue Length 95th (m)	2.0	0.0	0.6			
Control Delay (s)	12.7	0.0	0.7			
Lane LOS	B		A			
Approach Delay (s)	12.7	0.0	0.7			
Approach LOS	B					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			59.5%	ICU Level of Service		B
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
24: Mill Street & Commercial Driveway

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	99	275	13	8	10
Future Volume (Veh/h)	15	99	275	13	8	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	108	299	14	9	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	313				446	306
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	313				446	306
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	1247				563	734
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	124	313	20			
Volume Left	16	0	9			
Volume Right	0	14	11			
cSH	1247	1700	645			
Volume to Capacity	0.01	0.18	0.03			
Queue Length 95th (m)	0.3	0.0	0.8			
Control Delay (s)	1.1	0.0	10.8			
Lane LOS	A		B			
Approach Delay (s)	1.1	0.0	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			27.9%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	53	44	111	53	70	86
Future Volume (Veh/h)	53	44	111	53	70	86
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	48	121	58	76	93
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	395	150			179	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	395	150			179	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	95			95	
cM capacity (veh/h)	577	896			1397	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	106	179	169			
Volume Left	58	0	76			
Volume Right	48	58	0			
cSH	688	1700	1397			
Volume to Capacity	0.15	0.11	0.05			
Queue Length 95th (m)	4.3	0.0	1.4			
Control Delay (s)	11.2	0.0	3.7			
Lane LOS	B		A			
Approach Delay (s)	11.2	0.0	3.7			
Approach LOS	B					
Intersection Summary						
Average Delay		4.0				
Intersection Capacity Utilization		33.1%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
27: 10th Line & Street A

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	10	4	22	21	4
Future Volume (Veh/h)	10	10	4	22	21	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	4	24	23	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	57	25	27			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57	25	27			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	948	1051	1587			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	22	28	27			
Volume Left	11	4	0			
Volume Right	11	0	4			
cSH	997	1587	1700			
Volume to Capacity	0.02	0.00	0.02			
Queue Length 95th (m)	0.5	0.1	0.0			
Control Delay (s)	8.7	1.1	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	1.1	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			14.6%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
29: 10th Line & 4-Plex Driveway

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	3	1	33	22	1
Future Volume (Veh/h)	3	3	1	33	22	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	1	36	24	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	62	24	25			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	24	25			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	943	1052	1589			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	6	37	25			
Volume Left	3	1	0			
Volume Right	3	0	1			
cSH	994	1589	1700			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.6	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.6	0.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	29	8	6	47	7	49	5	65	33	48	95	18
Future Volume (vph)	29	8	6	47	7	49	5	65	33	48	95	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	9	7	51	8	53	5	71	36	52	103	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	48	112	112	175								
Volume Left (vph)	32	51	5	52								
Volume Right (vph)	7	53	36	20								
Hadj (s)	0.08	-0.16	-0.15	0.02								
Departure Headway (s)	4.8	4.5	4.3	4.4								
Degree Utilization, x	0.06	0.14	0.13	0.22								
Capacity (veh/h)	694	750	789	773								
Control Delay (s)	8.1	8.2	8.0	8.6								
Approach Delay (s)	8.1	8.2	8.0	8.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			28.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	68	0	0	84	13	3	0	2	29	1	32
Future Volume (Veh/h)	19	68	0	0	84	13	3	0	2	29	1	32
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	74	0	0	91	14	3	0	2	32	1	35
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	105			74			250	221	74	216	214	98
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	105			74			250	221	74	216	214	98
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	96
cM capacity (veh/h)	1486			1526			670	668	988	731	674	958
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	95	105	5	68								
Volume Left	21	0	3	32								
Volume Right	0	14	2	35								
cSH	1486	1526	769	831								
Volume to Capacity	0.01	0.00	0.01	0.08								
Queue Length 95th (m)	0.3	0.0	0.2	2.1								
Control Delay (s)	1.7	0.0	9.7	9.7								
Lane LOS	A		A	A								
Approach Delay (s)	1.7	0.0	9.7	9.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay				3.2								
Intersection Capacity Utilization				22.0%	ICU Level of Service				A			
Analysis Period (min)				15								

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	371	7	12	419	6	28
Future Volume (Veh/h)	371	7	12	419	6	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	403	8	13	455	7	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			411		888	407
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			411		888	407
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	95
cM capacity (veh/h)			1148		311	644
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	411	468	37			
Volume Left	0	13	7			
Volume Right	8	0	30			
cSH	1700	1148	535			
Volume to Capacity	0.24	0.01	0.07			
Queue Length 95th (m)	0.0	0.3	1.8			
Control Delay (s)	0.0	0.3	12.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.3	12.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			44.4%	ICU Level of Service		A
Analysis Period (min)			15			

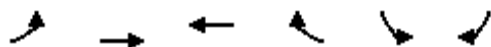
Norwood-Upper Mill Pond Development
39: 67 Mill St. Access Rd. A & Mill Street

2029 Future Total Traffic Volumes
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘	
Traffic Volume (veh/h)	70	16	3	142	44	8
Future Volume (Veh/h)	70	16	3	142	44	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	17	3	154	48	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			93		244	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			93		244	84
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1501		742	975
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	93	157	57			
Volume Left	0	3	48			
Volume Right	17	0	9			
cSH	1700	1501	771			
Volume to Capacity	0.05	0.00	0.07			
Queue Length 95th (m)	0.0	0.0	1.9			
Control Delay (s)	0.0	0.2	10.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			19.9%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
41: Mill Street & 112 Mill St. Access Rd. A

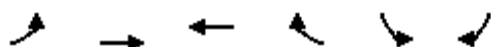
2029 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	76	139	0	1	6
Future Volume (Veh/h)	2	76	139	0	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	83	151	0	1	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	151				238	151
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	151				238	151
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1430				749	895
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	85	151	8			
Volume Left	2	0	1			
Volume Right	0	0	7			
cSH	1430	1700	874			
Volume to Capacity	0.00	0.09	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.2	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
43: Mill Street & 112 Mill St. Access B

2029 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	70	119	1	3	20
Future Volume (Veh/h)	7	70	119	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	76	129	1	3	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	130				222	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130				222	130
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1455				762	920
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	84	130	25			
Volume Left	8	0	3			
Volume Right	0	1	22			
cSH	1455	1700	898			
Volume to Capacity	0.01	0.08	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	0.8	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.8	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			19.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

45: 67 Mill St. Access B/112 Mill St. Access C & Mill Street

2029 Future Total Traffic Volumes

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	34	28	4	17	2	72	0	12	5	0	31
Future Volume (Veh/h)	11	34	28	4	17	2	72	0	12	5	0	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	37	30	4	18	2	78	0	13	5	0	34
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	20			67			137	104	52	116	118	19
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	20			67			137	104	52	116	118	19
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			90	100	99	99	100	97
cM capacity (veh/h)	1596			1535			801	778	1016	843	764	1059
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	79	24	91	39								
Volume Left	12	4	78	5								
Volume Right	30	2	13	34								
cSH	1596	1535	826	1025								
Volume to Capacity	0.01	0.00	0.11	0.04								
Queue Length 95th (m)	0.2	0.1	3.0	0.9								
Control Delay (s)	1.2	1.2	9.9	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.2	1.2	9.9	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			5.8									
Intersection Capacity Utilization			23.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Total Traffic Volumes
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	680	263	30	455	41	234	102	34	52	106	69
Future Volume (vph)	113	680	263	30	455	41	234	102	34	52	106	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			1.00		0.98	0.99			0.98	
Frt		0.958			0.987			0.962			0.959	
Flt Protected	0.950			0.950			0.950				0.989	
Satd. Flow (prot)	1662	1603	0	1662	1552	0	1568	1625	0	0	1570	0
Flt Permitted	0.346			0.067			0.420				0.879	
Satd. Flow (perm)	603	1603	0	117	1552	0	680	1625	0	0	1395	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			5			17			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Adj. Flow (vph)	123	739	286	33	495	45	254	111	37	57	115	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	1025	0	33	540	0	254	148	0	0	247	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Total Traffic Volumes
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		40.5	37.0			23.0	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.37	0.34			0.21	
v/c Ratio	0.37	1.15		0.52	0.63		0.75	0.26			0.81	
Control Delay	20.2	107.7		53.0	22.6		41.4	23.9			57.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	20.2	107.7		53.0	22.6		41.4	23.9			57.9	
LOS	C	F		D	C		D	C			E	
Approach Delay		98.3			24.4			34.9			57.9	
Approach LOS		F			C			C			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 109.7

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 65.5

Intersection LOS: E

Intersection Capacity Utilization 122.1%

ICU Level of Service H

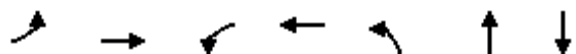
Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7

66 s	14 s	40 s
66 s	54 s	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Total Traffic Volumes
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	123	1025	33	540	254	148	247
v/c Ratio	0.37	1.15	0.52	0.63	0.75	0.26	0.81
Control Delay	20.2	107.7	53.0	22.6	41.4	23.9	57.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	107.7	53.0	22.6	41.4	23.9	57.9
Queue Length 50th (m)	14.9	~271.0	4.5	79.2	42.5	21.0	49.4
Queue Length 95th (m)	36.3	#400.5	#24.7	142.1	65.0	36.7	78.9
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	330	888	64	852	340	717	440
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	1.15	0.52	0.63	0.75	0.21	0.56

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.

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2029 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	680	263	30	455	41	234	102	34	52	106	69
Future Volume (vph)	113	680	263	30	455	41	234	102	34	52	106	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1655	1604		1662	1553		1558	1626			1571	
Flt Permitted	0.35	1.00		0.07	1.00		0.42	1.00			0.88	
Satd. Flow (perm)	603	1604		116	1553		688	1626			1397	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	739	286	33	495	45	254	111	37	57	115	75
RTOR Reduction (vph)	0	10	0	0	2	0	0	11	0	0	14	0
Lane Group Flow (vph)	123	1015	0	33	538	0	254	137	0	0	233	0
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		37.1	37.1			23.1	
Effective Green, g (s)	60.1	60.1		60.1	60.1		37.1	37.1			23.1	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.34	0.34			0.21	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	330	878		63	850		319	549			294	
v/s Ratio Prot		c0.63			0.35		c0.08	0.08				
v/s Ratio Perm	0.20			0.28			c0.19				0.17	
v/c Ratio	0.37	1.16		0.52	0.63		0.80	0.25			0.79	
Uniform Delay, d1	14.1	24.8		15.7	17.2		32.4	26.2			41.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	3.2	82.9		27.8	3.6		12.9	0.2			13.5	
Delay (s)	17.3	107.7		43.5	20.7		45.3	26.5			54.6	
Level of Service	B	F		D	C		D	C			D	
Approach Delay (s)		98.0			22.0			38.4			54.6	
Approach LOS		F			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			65.0			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			109.7			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			122.1%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	57	636	6	5	586
Future Volume (Veh/h)	20	57	636	6	5	586
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	62	691	7	5	637
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1342	694			698	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1342	694			698	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	86			99	
cM capacity (veh/h)	169	446			908	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	84	698	642			
Volume Left	22	0	5			
Volume Right	62	7	0			
cSH	312	1700	908			
Volume to Capacity	0.27	0.41	0.01			
Queue Length 95th (m)	8.5	0.0	0.1			
Control Delay (s)	20.8	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	20.8	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay		1.3				
Intersection Capacity Utilization		49.1%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	34	50	20	19	17
Future Volume (Veh/h)	14	34	50	20	19	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	37	54	22	21	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	160	30	39			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160	30	39			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	97			
cM capacity (veh/h)	802	1044	1571			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	52	76	39			
Volume Left	15	54	0			
Volume Right	37	0	18			
cSH	961	1571	1700			
Volume to Capacity	0.05	0.03	0.02			
Queue Length 95th (m)	1.4	0.9	0.0			
Control Delay (s)	9.0	5.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	5.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization		20.5%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street/Street A & Mill Street

2029 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	57	5	104	120	9	10	136	257	8	44	35
Future Volume (Veh/h)	14	57	5	104	120	9	10	136	257	8	44	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	62	5	113	130	10	11	148	279	9	48	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	140			67			518	460	64	808	458	135
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140			67			518	460	64	808	458	135
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			97	68	72	94	90	96
cM capacity (veh/h)	1443			1535			387	456	1000	152	458	914
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	82	253	438	95								
Volume Left	15	113	11	9								
Volume Right	5	10	279	38								
cSH	1443	1535	693	462								
Volume to Capacity	0.01	0.07	0.63	0.21								
Queue Length 95th (m)	0.3	1.9	36.1	6.1								
Control Delay (s)	1.4	3.7	18.7	14.8								
Lane LOS	A	A	C	B								
Approach Delay (s)	1.4	3.7	18.7	14.8								
Approach LOS			C	B								
Intersection Summary												
Average Delay			12.3									
Intersection Capacity Utilization			51.3%	ICU Level of Service					A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2029 Future Total Traffic Volumes
PM Peak Hour

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	29	28	615	83	95	511		
Future Volume (Veh/h)	29	28	615	83	95	511		
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	32	30	668	90	103	555		
Pedestrians								
Lane Width (m)								
Walking Speed (m/s)								
Percent Blockage								
Right turn flare (veh)								
Median type			None		None			
Median storage veh								
Upstream signal (m)			376					
pX, platoon unblocked	0.59	0.59			0.59			
vC, conflicting volume	1474	713			758			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	1456	175			251			
tC, single (s)	6.4	6.2			4.1			
tC, 2 stage (s)								
tF (s)	3.5	3.3			2.2			
p0 queue free %	57	94			87			
cM capacity (veh/h)	74	516			781			
Direction, Lane #	WB 1	NB 1	SB 1	SB 2				
Volume Total	62	758	69	589				
Volume Left	32	0	69	34				
Volume Right	30	90	0	0				
cSH	126	1700	781	781				
Volume to Capacity	0.49	0.45	0.13	0.13				
Queue Length 95th (m)	18.1	0.0	3.6	3.6				
Control Delay (s)	58.6	0.0	10.3	2.5				
Lane LOS	F		B	A				
Approach Delay (s)	58.6	0.0	3.3					
Approach LOS	F							
Intersection Summary								
Average Delay			3.9					
Intersection Capacity Utilization			68.6%	ICU Level of Service		C		
Analysis Period (min)			15					

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2029 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	25	0	12	0	686	96	8	531	0
Future Volume (Veh/h)	0	0	0	25	0	12	0	686	96	8	531	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	27	0	13	0	746	104	9	577	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked	0.50	0.50		0.50	0.50	0.50				0.50		
vC, conflicting volume	1406	1445	577	1393	1393	798	577			850		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1311	1390	577	1285	1285	91	577			196		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	61	100	97	100			99		
cM capacity (veh/h)	65	70	516	70	81	481	996			686		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	40	850	9	577							
Volume Left	0	27	0	9	0							
Volume Right	0	13	104	0	0							
cSH	1700	97	996	686	1700							
Volume to Capacity	0.00	0.41	0.00	0.01	0.34							
Queue Length 95th (m)	0.0	13.7	0.0	0.3	0.0							
Control Delay (s)	0.0	66.4	0.0	10.3	0.0							
Lane LOS	A	F		B								
Approach Delay (s)	0.0	66.4	0.0	0.2								
Approach LOS	A	F										
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			55.5%			ICU Level of Service			B			
Analysis Period (min)			15									

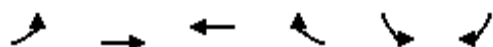
Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	210	153	32	218	184
Future Volume (Veh/h)	38	210	153	32	218	184
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	228	166	35	237	200
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	840	166			166	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	840	166			166	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	74			83	
cM capacity (veh/h)	279	878			1412	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	269	166	35	437		
Volume Left	41	0	0	237		
Volume Right	228	0	35	0		
cSH	662	1700	1700	1412		
Volume to Capacity	0.41	0.10	0.02	0.17		
Queue Length 95th (m)	15.8	0.0	0.0	4.8		
Control Delay (s)	14.1	0.0	0.0	5.1		
Lane LOS	B			A		
Approach Delay (s)	14.1	0.0		5.1		
Approach LOS	B					
Intersection Summary						
Average Delay			6.6			
Intersection Capacity Utilization			54.9%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
20: Mill Street & Commercial Driveway

2029 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	36	286	197	29	29	36
Future Volume (Veh/h)	36	286	197	29	29	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	311	214	32	32	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	246				619	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				619	230
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				93	95
cM capacity (veh/h)	1320				439	809
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	350	246	71			
Volume Left	39	0	32			
Volume Right	0	32	39			
cSH	1320	1700	586			
Volume to Capacity	0.03	0.14	0.12			
Queue Length 95th (m)	0.7	0.0	3.3			
Control Delay (s)	1.1	0.0	12.0			
Lane LOS	A		B			
Approach Delay (s)	1.1	0.0	12.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			43.0%	ICU Level of Service		A
Analysis Period (min)			15			

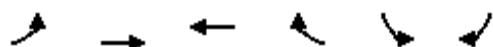
Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	36	746	18	33	523
Future Volume (Veh/h)	3	36	746	18	33	523
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	39	811	20	36	568
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			169			
pX, platoon unblocked	0.49	0.49			0.49	
vC, conflicting volume	1461	821			831	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1420	116			136	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			95	
cM capacity (veh/h)	70	459			710	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	42	831	604			
Volume Left	3	0	36			
Volume Right	39	20	0			
cSH	329	1700	710			
Volume to Capacity	0.13	0.49	0.05			
Queue Length 95th (m)	3.5	0.0	1.3			
Control Delay (s)	17.5	0.0	1.4			
Lane LOS	C		A			
Approach Delay (s)	17.5	0.0	1.4			
Approach LOS	C					
Intersection Summary						
Average Delay		1.1				
Intersection Capacity Utilization		69.2%		ICU Level of Service		C
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
24: Mill Street & Street C

2029 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	227	148	11	7	77
Future Volume (Veh/h)	88	227	148	11	7	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	247	161	12	8	84
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	173				606	167
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	173				606	167
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	90
cM capacity (veh/h)	1404				429	877
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	343	173	92			
Volume Left	96	0	8			
Volume Right	0	12	84			
cSH	1404	1700	804			
Volume to Capacity	0.07	0.10	0.11			
Queue Length 95th (m)	1.8	0.0	3.1			
Control Delay (s)	2.6	0.0	10.1			
Lane LOS	A		B			
Approach Delay (s)	2.6	0.0	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			40.4%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	18	167	39	47	175
Future Volume (Veh/h)	35	18	167	39	47	175
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	20	182	42	51	190
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	495	203			224	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	495	203			224	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	98			96	
cM capacity (veh/h)	514	838			1345	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	58	224	241			
Volume Left	38	0	51			
Volume Right	20	42	0			
cSH	593	1700	1345			
Volume to Capacity	0.10	0.13	0.04			
Queue Length 95th (m)	2.6	0.0	0.9			
Control Delay (s)	11.7	0.0	1.9			
Lane LOS	B		A			
Approach Delay (s)	11.7	0.0	1.9			
Approach LOS	B					
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		36.3%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
27: 10th Line & 4-Plex Driveway

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	3	3	28	37	3
Future Volume (Veh/h)	3	3	3	28	37	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	3	30	40	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	78	42	43			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78	42	43			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	924	1029	1566			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	6	33	43			
Volume Left	3	3	0			
Volume Right	3	0	3			
cSH	974	1566	1700			
Volume to Capacity	0.01	0.00	0.03			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.7	0.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	0.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			14.0%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
29: 10th Line & Street A

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	7	11	23	29	11
Future Volume (Veh/h)	7	7	11	23	29	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	8	12	25	32	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	87	38	44			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	87	38	44			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	907	1034	1564			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	16	37	44			
Volume Left	8	12	0			
Volume Right	8	0	12			
cSH	966	1564	1700			
Volume to Capacity	0.02	0.01	0.03			
Queue Length 95th (m)	0.4	0.2	0.0			
Control Delay (s)	8.8	2.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	2.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		2.4				
Intersection Capacity Utilization		18.5%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2029 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	5	3	47	10	63	5	137	58	68	123	18
Future Volume (vph)	11	5	3	47	10	63	5	137	58	68	123	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	5	3	51	11	68	5	149	63	74	134	20
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	20	130	217	228								
Volume Left (vph)	12	51	5	74								
Volume Right (vph)	3	68	63	20								
Hadj (s)	0.06	-0.20	-0.14	0.05								
Departure Headway (s)	5.2	4.7	4.4	4.6								
Degree Utilization, x	0.03	0.17	0.27	0.29								
Capacity (veh/h)	618	690	781	752								
Control Delay (s)	8.3	8.7	9.0	9.4								
Approach Delay (s)	8.3	8.7	9.0	9.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	9.1											
Level of Service	A											
Intersection Capacity Utilization	40.0%			ICU Level of Service			A					
Analysis Period (min)	15											

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2029 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	111	3	2	96	38	1	0	1	21	1	24
Future Volume (Veh/h)	32	111	3	2	96	38	1	0	1	21	1	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	121	3	2	104	41	1	0	1	23	1	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	145			124			348	342	122	322	322	124
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	145			124			348	342	122	322	322	124
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	96	100	97
cM capacity (veh/h)	1437			1463			578	566	929	618	580	926
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	159	147	2	50								
Volume Left	35	2	1	23								
Volume Right	3	41	1	26								
cSH	1437	1463	712	746								
Volume to Capacity	0.02	0.00	0.00	0.07								
Queue Length 95th (m)	0.6	0.0	0.1	1.7								
Control Delay (s)	1.8	0.1	10.1	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.8	0.1	10.1	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			28.6%	ICU Level of Service				A				
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	624	8	32	579	5	24
Future Volume (Veh/h)	624	8	32	579	5	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	678	9	35	629	5	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			687	1382		682
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			687	1382		682
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			96	97		94
cM capacity (veh/h)			907	153		450
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	687	664	31			
Volume Left	0	35	5			
Volume Right	9	0	26			
cSH	1700	907	342			
Volume to Capacity	0.40	0.04	0.09			
Queue Length 95th (m)	0.0	1.0	2.4			
Control Delay (s)	0.0	1.0	16.6			
Lane LOS			A C			
Approach Delay (s)	0.0	1.0	16.6			
Approach LOS						
C						
Intersection Summary						
Average Delay						
			0.9			
Intersection Capacity Utilization			71.5%		ICU Level of Service	
					C	
Analysis Period (min)			15			

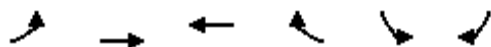
Norwood-Upper Mill Pond Development
39: 67 Mill St. Access A & Mill Street

2029 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	183	51	9	130	30	6
Future Volume (Veh/h)	183	51	9	130	30	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	199	55	10	141	33	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			254		388	226
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			254		388	226
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	99
cM capacity (veh/h)			1311		611	813
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	254	151	40			
Volume Left	0	10	33			
Volume Right	55	0	7			
cSH	1700	1311	639			
Volume to Capacity	0.15	0.01	0.06			
Queue Length 95th (m)	0.0	0.2	1.6			
Control Delay (s)	0.0	0.6	11.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			24.2%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
41: Mill Street & 112 Mill St. Access A

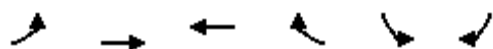
2029 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	183	135	1	1	4
Future Volume (Veh/h)	6	183	135	1	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	199	147	1	1	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	148				360	148
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148				360	148
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1434				635	899
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	206	148	5			
Volume Left	7	0	1			
Volume Right	0	1	4			
cSH	1434	1700	830			
Volume to Capacity	0.00	0.09	0.01			
Queue Length 95th (m)	0.1	0.0	0.1			
Control Delay (s)	0.3	0.0	9.4			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			24.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
43: Mill Street & 112 Mill St. Access B

2029 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	160	122	4	2	13
Future Volume (Veh/h)	23	160	122	4	2	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	174	133	4	2	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	137				359	135
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				359	135
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1447				629	914
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	199	137	16			
Volume Left	25	0	2			
Volume Right	0	4	14			
cSH	1447	1700	865			
Volume to Capacity	0.02	0.08	0.02			
Queue Length 95th (m)	0.4	0.0	0.5			
Control Delay (s)	1.1	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	1.1	0.0	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			29.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

45: 67 Mill St. Access B/112 Mill St. Access C & Mill Street

2029 Future Total Traffic Volumes

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	37	90	14	47	6	58	0	8	4	0	21
Future Volume (Veh/h)	35	37	90	14	47	6	58	0	8	4	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	40	98	15	51	7	63	0	9	4	0	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	58			138			272	253	89	258	298	54
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	58			138			272	253	89	258	298	54
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			90	100	99	99	100	98
cM capacity (veh/h)	1546			1446			647	628	969	670	592	1012
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	73	72	27								
Volume Left	38	15	63	4								
Volume Right	98	7	9	23								
cSH	1546	1446	675	941								
Volume to Capacity	0.02	0.01	0.11	0.03								
Queue Length 95th (m)	0.6	0.3	2.9	0.7								
Control Delay (s)	1.7	1.6	11.0	8.9								
Lane LOS	A	A	B	A								
Approach Delay (s)	1.7	1.6	11.0	8.9								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			29.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Total Traffic Volumes
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	326	125	25	434	17	300	75	30	35	78	89
Future Volume (vph)	33	326	125	25	434	17	300	75	30	35	78	89
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.99	1.00		0.98	0.99			0.97	
Frt		0.958			0.994			0.957			0.940	
Flt Protected	0.950			0.950			0.950				0.991	
Satd. Flow (prot)	1397	1424	0	1458	1567	0	1599	1629	0	0	1542	0
Flt Permitted	0.396			0.396			0.396				0.918	
Satd. Flow (perm)	579	1424	0	599	1567	0	653	1629	0	0	1422	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			2			20			33	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Adj. Flow (vph)	36	354	136	27	472	18	326	82	33	38	85	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	490	0	27	490	0	326	115	0	0	220	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Total Traffic Volumes
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		36.6	33.2			19.2	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.35	0.31			0.18	
v/c Ratio	0.11	0.60		0.08	0.55		1.01	0.22			0.77	
Control Delay	13.6	19.3		13.2	18.5		83.8	22.4			53.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	13.6	19.3		13.2	18.5		83.8	22.4			53.1	
LOS	B	B		B	B		F	C			D	
Approach Delay		18.9			18.2			67.8			53.1	
Approach LOS		B			B			E			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 105.9

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 35.7

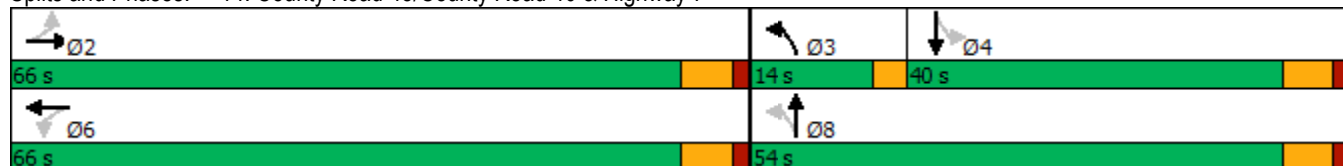
Intersection LOS: D

Intersection Capacity Utilization 77.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Total Traffic Volumes
AM Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	36	490	27	490	326	115	220
v/c Ratio	0.11	0.60	0.08	0.55	1.01	0.22	0.77
Control Delay	13.6	19.3	13.2	18.5	83.8	22.4	53.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	19.3	13.2	18.5	83.8	22.4	53.1
Queue Length 50th (m)	3.4	62.2	2.5	62.5	~57.7	14.9	39.0
Queue Length 95th (m)	10.5	116.8	8.4	113.3	#115.3	28.7	65.7
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	328	818	340	890	324	745	475
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.60	0.08	0.55	1.01	0.15	0.46
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.							

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	326	125	25	434	17	300	75	30	35	78	89
Future Volume (vph)	33	326	125	25	434	17	300	75	30	35	78	89
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	0.99	1.00		0.98	1.00		0.99	1.00			1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.96			0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1390	1427		1436	1568		1589	1630			1541	
Flt Permitted	0.40	1.00		0.40	1.00		0.40	1.00			0.92	
Satd. Flow (perm)	579	1427		599	1568		662	1630			1427	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	354	136	27	472	18	326	82	33	38	85	97
RTOR Reduction (vph)	0	10	0	0	1	0	0	14	0	0	27	0
Lane Group Flow (vph)	36	480	0	27	489	0	326	101	0	0	193	0
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		33.2	33.2			19.2	
Effective Green, g (s)	60.1	60.1		60.1	60.1		33.2	33.2			19.2	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.31	0.31			0.18	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	328	810		340	890		304	511			258	
v/s Ratio Prot		c0.34			0.31		c0.11	0.06				
v/s Ratio Perm	0.06			0.05			c0.22				0.14	
v/c Ratio	0.11	0.59		0.08	0.55		1.07	0.20			0.75	
Uniform Delay, d1	10.5	14.9		10.3	14.4		35.8	26.6			41.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.7	3.2		0.5	2.4		72.2	0.2			11.2	
Delay (s)	11.2	18.1		10.8	16.8		107.9	26.8			52.2	
Level of Service	B	B		B	B		F	C			D	
Approach Delay (s)		17.6			16.5			86.8			52.2	
Approach LOS		B			B			F			D	
Intersection Summary												
HCM 2000 Control Delay			39.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			105.8			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			77.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	73	362	0	0	483
Future Volume (Veh/h)	25	73	362	0	0	483
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	79	393	0	0	525
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	918	393			393	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	918	393			393	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	88			100	
cM capacity (veh/h)	304	660			1177	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	106	393	525			
Volume Left	27	0	0			
Volume Right	79	0	0			
cSH	509	1700	1177			
Volume to Capacity	0.21	0.23	0.00			
Queue Length 95th (m)	6.2	0.0	0.0			
Control Delay (s)	13.9	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	13.9	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		40.1%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	40	18	15	24	5
Future Volume (Veh/h)	12	40	18	15	24	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	43	20	16	26	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	84	28	31			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	84	28	31			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	96	99			
cM capacity (veh/h)	905	1046	1582			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	56	36	31			
Volume Left	13	20	0			
Volume Right	43	0	5			
cSH	1010	1582	1700			
Volume to Capacity	0.06	0.01	0.02			
Queue Length 95th (m)	1.4	0.3	0.0			
Control Delay (s)	8.8	4.1	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	4.1	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			18.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street/Street A & Mill Street

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	2	132	153	3	1	50	87	5	65	52
Future Volume (Veh/h)	5	22	2	132	153	3	1	50	87	5	65	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	24	2	143	166	3	1	54	95	5	71	57
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	169			26			581	490	25	610	490	168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	169			26			581	490	25	610	490	168
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	88	91	98	84	93
cM capacity (veh/h)	1409			1588			323	434	1051	311	435	877
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	31	312	150	133								
Volume Left	5	143	1	5								
Volume Right	2	3	95	57								
cSH	1409	1588	689	544								
Volume to Capacity	0.00	0.09	0.22	0.24								
Queue Length 95th (m)	0.1	2.4	6.6	7.6								
Control Delay (s)	1.2	3.8	11.7	13.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.2	3.8	11.7	13.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			39.0%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	13	350	36	43	466
Future Volume (Veh/h)	34	13	350	36	43	466
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	14	380	39	47	507
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			376			
pX, platoon unblocked						
vC, conflicting volume	1000	400			419	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1000	400			419	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	98			96	
cM capacity (veh/h)	258	650			1140	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	51	419	47	507		
Volume Left	37	0	47	0		
Volume Right	14	39	0	0		
cSH	309	1700	1140	1700		
Volume to Capacity	0.16	0.25	0.04	0.30		
Queue Length 95th (m)	4.7	0.0	1.0	0.0		
Control Delay (s)	18.9	0.0	8.3	0.0		
Lane LOS	C		A			
Approach Delay (s)	18.9	0.0	0.7			
Approach LOS	C					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			39.0%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	24	0	13	0	373	36	30	470	0
Future Volume (Veh/h)	0	0	0	24	0	13	0	373	36	30	470	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	26	0	14	0	405	39	33	511	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked												
vC, conflicting volume	1016	1021	511	1002	1002	424	511			444		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1016	1021	511	1002	1002	424	511			444		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	88	100	98	100			97		
cM capacity (veh/h)	207	229	563	216	235	630	1054			1116		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	40	444	33	511							
Volume Left	0	26	0	33	0							
Volume Right	0	14	39	0	0							
cSH	1700	281	1054	1116	1700							
Volume to Capacity	0.00	0.14	0.00	0.03	0.30							
Queue Length 95th (m)	0.0	3.9	0.0	0.7	0.0							
Control Delay (s)	0.0	19.9	0.0	8.3	0.0							
Lane LOS	A	C		A								
Approach Delay (s)	0.0	19.9	0.0	0.5								
Approach LOS	A	C										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			37.1%		ICU Level of Service				A			
Analysis Period (min)			15									

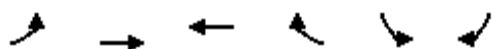
Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	28	267	138	25	92	135
Future Volume (Veh/h)	28	267	138	25	92	135
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	290	150	27	100	147
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	497	150			150	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	497	150			150	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	68			93	
cM capacity (veh/h)	495	896			1431	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	320	150	27	247		
Volume Left	30	0	0	100		
Volume Right	290	0	27	0		
cSH	833	1700	1700	1431		
Volume to Capacity	0.38	0.09	0.02	0.07		
Queue Length 95th (m)	14.6	0.0	0.0	1.8		
Control Delay (s)	12.0	0.0	0.0	3.5		
Lane LOS	B			A		
Approach Delay (s)	12.0	0.0		3.5		
Approach LOS	B					
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			47.5%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
20: Mill Street & Street C

2029 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	76	182	4	10	106
Future Volume (Veh/h)	32	76	182	4	10	106
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	83	198	4	11	115
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	202				353	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	202				353	200
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				98	86
cM capacity (veh/h)	1370				628	841
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	118	202	126			
Volume Left	35	0	11			
Volume Right	0	4	115			
cSH	1370	1700	817			
Volume to Capacity	0.03	0.12	0.15			
Queue Length 95th (m)	0.6	0.0	4.4			
Control Delay (s)	2.4	0.0	10.2			
Lane LOS	A		B			
Approach Delay (s)	2.4	0.0	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			32.7%	ICU Level of Service		A
Analysis Period (min)			15			

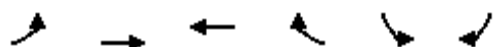
Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	28	381	11	28	466
Future Volume (Veh/h)	9	28	381	11	28	466
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	30	414	12	30	507
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			169			
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	987	420			426	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	934	308			314	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	95			97	
cM capacity (veh/h)	260	663			1129	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	40	426	537			
Volume Left	10	0	30			
Volume Right	30	12	0			
cSH	478	1700	1129			
Volume to Capacity	0.08	0.25	0.03			
Queue Length 95th (m)	2.2	0.0	0.7			
Control Delay (s)	13.2	0.0	0.8			
Lane LOS	B		A			
Approach Delay (s)	13.2	0.0	0.8			
Approach LOS	B					
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		61.5%		ICU Level of Service		B
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
24: Mill Street & Commercial Driveway

2029 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	99	276	13	8	10
Future Volume (Veh/h)	15	99	276	13	8	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	108	300	14	9	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	314				447	307
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	314				447	307
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1246				562	733
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	124	314	20			
Volume Left	16	0	9			
Volume Right	0	14	11			
cSH	1246	1700	645			
Volume to Capacity	0.01	0.18	0.03			
Queue Length 95th (m)	0.3	0.0	0.8			
Control Delay (s)	1.1	0.0	10.8			
Lane LOS	A		B			
Approach Delay (s)	1.1	0.0	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			27.9%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	55	46	117	55	73	90
Future Volume (Veh/h)	55	46	117	55	73	90
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	50	127	60	79	98
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	413	157			187	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	413	157			187	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	94			94	
cM capacity (veh/h)	562	889			1387	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	110	187	177			
Volume Left	60	0	79			
Volume Right	50	60	0			
cSH	674	1700	1387			
Volume to Capacity	0.16	0.11	0.06			
Queue Length 95th (m)	4.6	0.0	1.4			
Control Delay (s)	11.4	0.0	3.7			
Lane LOS	B		A			
Approach Delay (s)	11.4	0.0	3.7			
Approach LOS	B					
Intersection Summary						
Average Delay		4.0				
Intersection Capacity Utilization		34.1%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
27: 10th Line & Street A

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	10	4	23	20	4
Future Volume (Veh/h)	10	10	4	23	20	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	4	25	22	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	57	24	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57	24	26			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	948	1052	1588			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	22	29	26			
Volume Left	11	4	0			
Volume Right	11	0	4			
cSH	998	1588	1700			
Volume to Capacity	0.02	0.00	0.02			
Queue Length 95th (m)	0.5	0.1	0.0			
Control Delay (s)	8.7	1.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	1.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			14.6%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
29: 10th Line & 4-Plex Driveway

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	3	1	33	23	1
Future Volume (Veh/h)	3	3	1	33	23	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	1	36	25	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	64	26	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64	26	26			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	942	1050	1588			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	6	37	26			
Volume Left	3	1	0			
Volume Right	3	0	1			
cSH	993	1588	1700			
Volume to Capacity	0.01	0.00	0.02			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.6	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.6	0.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	9	7	48	8	51	6	68	34	50	98	19
Future Volume (vph)	30	9	7	48	8	51	6	68	34	50	98	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	10	8	52	9	55	7	74	37	54	107	21
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	116	118	182								
Volume Left (vph)	33	52	7	54								
Volume Right (vph)	8	55	37	21								
Hadj (s)	0.07	-0.16	-0.14	0.02								
Departure Headway (s)	4.8	4.5	4.4	4.5								
Degree Utilization, x	0.07	0.14	0.14	0.23								
Capacity (veh/h)	688	742	781	767								
Control Delay (s)	8.2	8.3	8.1	8.8								
Approach Delay (s)	8.2	8.3	8.1	8.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization				29.0%	ICU Level of Service	A						
Analysis Period (min)				15								

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2029 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	71	0	0	88	13	3	0	2	29	1	33
Future Volume (Veh/h)	20	71	0	0	88	13	3	0	2	29	1	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	77	0	0	96	14	3	0	2	32	1	36
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	110			77			260	231	77	226	224	103
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110			77			260	231	77	226	224	103
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	96
cM capacity (veh/h)	1480			1522			658	659	984	720	665	952
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	99	110	5	69								
Volume Left	22	0	3	32								
Volume Right	0	14	2	36								
cSH	1480	1522	758	823								
Volume to Capacity	0.01	0.00	0.01	0.08								
Queue Length 95th (m)	0.4	0.0	0.2	2.2								
Control Delay (s)	1.8	0.0	9.8	9.8								
Lane LOS	A		A	A								
Approach Delay (s)	1.8	0.0	9.8	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			22.3%	ICU Level of Service				A				
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2029 Future Total Traffic Volumes
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	386	8	12	439	7	28
Future Volume (Veh/h)	386	8	12	439	7	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	420	9	13	477	8	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			429		928	424
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			429		928	424
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	95
cM capacity (veh/h)			1130		294	630
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	429	490	38			
Volume Left	0	13	8			
Volume Right	9	0	30			
cSH	1700	1130	508			
Volume to Capacity	0.25	0.01	0.07			
Queue Length 95th (m)	0.0	0.3	1.9			
Control Delay (s)	0.0	0.3	12.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.3	12.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			45.6%	ICU Level of Service		A
Analysis Period (min)			15			

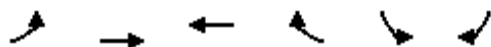
Norwood-Upper Mill Pond Development
39: 67 Mill St. Access Rd. A & Mill Street

2029 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	70	16	3	142	44	8
Future Volume (Veh/h)	70	16	3	142	44	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	17	3	154	48	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			93	244		84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			93	244		84
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			100	94		99
cM capacity (veh/h)			1501	742		975
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	93	157	57			
Volume Left	0	3	48			
Volume Right	17	0	9			
cSH	1700	1501	771			
Volume to Capacity	0.05	0.00	0.07			
Queue Length 95th (m)	0.0	0.0	1.9			
Control Delay (s)	0.0	0.2	10.0			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.2	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			19.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
41: Mill Street & 112 Mill St. Access Rd. A

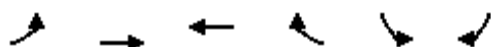
2029 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	76	139	0	1	6
Future Volume (Veh/h)	2	76	139	0	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	83	151	0	1	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	151				238	151
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	151				238	151
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1430				749	895
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	85	151	8			
Volume Left	2	0	1			
Volume Right	0	0	7			
cSH	1430	1700	874			
Volume to Capacity	0.00	0.09	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.2	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
43: Mill Street & 112 Mill St. Access B

2029 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	70	119	1	3	20
Future Volume (Veh/h)	7	70	119	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	76	129	1	3	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	130				222	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130				222	130
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1455				762	920
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	84	130	25			
Volume Left	8	0	3			
Volume Right	0	1	22			
cSH	1455	1700	898			
Volume to Capacity	0.01	0.08	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	0.8	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.8	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			19.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

45: 67 Mill St. Access B/112 Mill St. Access C & Mill Street

2029 Future Total Traffic Volumes

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	35	28	4	17	2	72	0	12	5	0	31
Future Volume (Veh/h)	11	35	28	4	17	2	72	0	12	5	0	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	38	30	4	18	2	78	0	13	5	0	34
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	20			68			138	105	53	117	119	19
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	20			68			138	105	53	117	119	19
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			90	100	99	99	100	97
cM capacity (veh/h)	1596			1533			800	777	1014	842	763	1059
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	80	24	91	39								
Volume Left	12	4	78	5								
Volume Right	30	2	13	34								
cSH	1596	1533	825	1025								
Volume to Capacity	0.01	0.00	0.11	0.04								
Queue Length 95th (m)	0.2	0.1	3.0	0.9								
Control Delay (s)	1.1	1.2	9.9	8.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.1	1.2	9.9	8.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			5.8									
Intersection Capacity Utilization			23.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Total Traffic Volumes
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	707	269	31	476	42	239	105	36	54	109	71
Future Volume (vph)	116	707	269	31	476	42	239	105	36	54	109	71
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			1.00		0.98	0.99			0.98	
Frt		0.959			0.988			0.962			0.959	
Flt Protected	0.950			0.950			0.950				0.989	
Satd. Flow (prot)	1662	1605	0	1662	1553	0	1568	1625	0	0	1570	0
Flt Permitted	0.327			0.067			0.416				0.877	
Satd. Flow (perm)	570	1605	0	117	1553	0	674	1625	0	0	1392	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			5			17			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Adj. Flow (vph)	126	768	292	34	517	46	260	114	39	59	118	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	1060	0	34	563	0	260	153	0	0	254	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Total Traffic Volumes
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8				4
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		41.0	37.6			23.5	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.37	0.34			0.21	
v/c Ratio	0.41	1.20		0.54	0.66		0.76	0.27			0.82	
Control Delay	21.6	125.6		55.4	23.9		42.7	24.0			58.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	21.6	125.6		55.4	23.9		42.7	24.0			58.8	
LOS	C	F		E	C		D	C			E	
Approach Delay		114.6			25.7			35.8			58.8	
Approach LOS		F			C			D			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 110.3

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 73.9

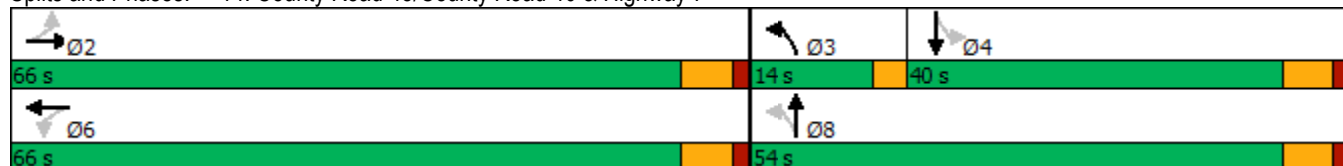
Intersection LOS: E

Intersection Capacity Utilization 124.7%

ICU Level of Service H

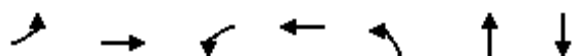
Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Total Traffic Volumes
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	126	1060	34	563	260	153	254
v/c Ratio	0.41	1.20	0.54	0.66	0.76	0.27	0.82
Control Delay	21.6	125.6	55.4	23.9	42.7	24.0	58.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	125.6	55.4	23.9	42.7	24.0	58.8
Queue Length 50th (m)	15.9	~290.6	4.7	85.8	43.7	21.9	51.3
Queue Length 95th (m)	38.2	#419.1	#25.2	151.6	66.7	38.0	81.6
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	310	885	63	849	340	713	438
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	1.20	0.54	0.66	0.76	0.21	0.58

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.

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2034 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	707	269	31	476	42	239	105	36	54	109	71
Future Volume (vph)	116	707	269	31	476	42	239	105	36	54	109	71
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1656	1605		1662	1553		1558	1624			1571	
Flt Permitted	0.33	1.00		0.07	1.00		0.42	1.00			0.88	
Satd. Flow (perm)	570	1605		116	1553		683	1624			1393	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	768	292	34	517	46	260	114	39	59	118	77
RTOR Reduction (vph)	0	10	0	0	2	0	0	11	0	0	14	0
Lane Group Flow (vph)	126	1050	0	34	561	0	260	142	0	0	240	0
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		37.6	37.6			23.6	
Effective Green, g (s)	60.1	60.1		60.1	60.1		37.6	37.6			23.6	
Actuated g/C Ratio	0.55	0.55		0.55	0.55		0.34	0.34			0.21	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	310	875		63	846		320	554			298	
v/s Ratio Prot		c0.65			0.36		c0.08	0.09				
v/s Ratio Perm	0.22			0.29			c0.20				0.17	
v/c Ratio	0.41	1.20		0.54	0.66		0.81	0.26			0.80	
Uniform Delay, d1	14.6	25.1		16.1	17.8		32.8	26.2			41.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	3.9	100.8		29.3	4.1		14.5	0.2			14.5	
Delay (s)	18.6	125.8		45.5	21.9		47.3	26.4			55.7	
Level of Service	B	F		D	C		D	C			E	
Approach Delay (s)		114.4			23.3			39.5			55.7	
Approach LOS		F			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			73.5			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			110.2			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			124.7%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	58	668	7	6	611
Future Volume (Veh/h)	20	58	668	7	6	611
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	63	726	8	7	664
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1408	730			734	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1408	730			734	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	85			99	
cM capacity (veh/h)	153	426			880	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	85	734	671			
Volume Left	22	0	7			
Volume Right	63	8	0			
cSH	292	1700	880			
Volume to Capacity	0.29	0.43	0.01			
Queue Length 95th (m)	9.4	0.0	0.2			
Control Delay (s)	22.3	0.0	0.2			
Lane LOS	C		A			
Approach Delay (s)	22.3	0.0	0.2			
Approach LOS	C					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			51.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	34	51	20	20	17
Future Volume (Veh/h)	14	34	51	20	20	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	37	55	22	22	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	163	31	40			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	163	31	40			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	96			
cM capacity (veh/h)	799	1043	1570			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	52	77	40			
Volume Left	15	55	0			
Volume Right	37	0	18			
cSH	959	1570	1700			
Volume to Capacity	0.05	0.04	0.02			
Queue Length 95th (m)	1.4	0.9	0.0			
Control Delay (s)	9.0	5.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	5.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization		20.5%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street/Street A & Mill Street

2034 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	57	6	104	120	9	10	136	257	8	44	35
Future Volume (Veh/h)	14	57	6	104	120	9	10	136	257	8	44	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	62	7	113	130	10	11	148	279	9	48	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	140			69			518	462	66	810	460	135
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140			69			518	462	66	810	460	135
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			97	68	72	94	89	96
cM capacity (veh/h)	1443			1532			386	456	998	151	456	914
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	84	253	438	95								
Volume Left	15	113	11	9								
Volume Right	7	10	279	38								
cSH	1443	1532	692	461								
Volume to Capacity	0.01	0.07	0.63	0.21								
Queue Length 95th (m)	0.3	1.9	36.2	6.1								
Control Delay (s)	1.4	3.7	18.7	14.8								
Lane LOS	A	A	C	B								
Approach Delay (s)	1.4	3.7	18.7	14.8								
Approach LOS			C	B								
Intersection Summary												
Average Delay			12.3									
Intersection Capacity Utilization			51.3%	ICU Level of Service				A				
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	29	29	646	83	96	535
Future Volume (Veh/h)	29	29	646	83	96	535
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	32	702	90	104	582
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			376			
pX, platoon unblocked	0.57	0.57			0.57	
vC, conflicting volume	1537	747			792	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1565	183			262	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	93			86	
cM capacity (veh/h)	60	491			745	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	64	792	69	617		
Volume Left	32	0	69	35		
Volume Right	32	90	0	0		
cSH	108	1700	745	745		
Volume to Capacity	0.60	0.47	0.14	0.14		
Queue Length 95th (m)	23.1	0.0	3.9	3.9		
Control Delay (s)	78.8	0.0	10.6	2.7		
Lane LOS	F		B	A		
Approach Delay (s)	78.8	0.0	3.5			
Approach LOS	F					
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilization			69.7%		ICU Level of Service	C
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2034 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	25	0	12	0	717	97	9	555	0
Future Volume (Veh/h)	0	0	0	25	0	12	0	717	97	9	555	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	27	0	13	0	779	105	10	603	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked	0.49	0.49		0.49	0.49	0.49				0.49		
vC, conflicting volume	1468	1507	603	1454	1454	832	603			884		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1434	1514	603	1408	1408	147	603			253		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	52	100	97	100			98		
cM capacity (veh/h)	53	58	499	57	67	445	975			648		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	40	884	10	603							
Volume Left	0	27	0	10	0							
Volume Right	0	13	105	0	0							
cSH	1700	79	975	648	1700							
Volume to Capacity	0.00	0.50	0.00	0.02	0.35							
Queue Length 95th (m)	0.0	17.0	0.0	0.4	0.0							
Control Delay (s)	0.0	89.8	0.0	10.6	0.0							
Lane LOS	A	F		B								
Approach Delay (s)	0.0	89.8	0.0	0.2								
Approach LOS	A	F										
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			57.4%			ICU Level of Service			B			
Analysis Period (min)			15									

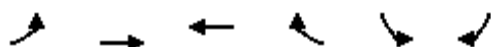
Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	212	160	33	221	192
Future Volume (Veh/h)	40	212	160	33	221	192
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	230	174	36	240	209
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	863	174			174	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	863	174			174	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	74			83	
cM capacity (veh/h)	269	869			1403	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	273	174	36	449		
Volume Left	43	0	0	240		
Volume Right	230	0	36	0		
cSH	644	1700	1700	1403		
Volume to Capacity	0.42	0.10	0.02	0.17		
Queue Length 95th (m)	16.9	0.0	0.0	4.9		
Control Delay (s)	14.6	0.0	0.0	5.1		
Lane LOS	B			A		
Approach Delay (s)	14.6	0.0		5.1		
Approach LOS	B					
Intersection Summary						
Average Delay			6.7			
Intersection Capacity Utilization			56.1%		ICU Level of Service	B
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
20: Mill Street & Commercial Driveway

2034 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	36	286	197	29	29	36
Future Volume (Veh/h)	36	286	197	29	29	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	311	214	32	32	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	246				619	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				619	230
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				93	95
cM capacity (veh/h)	1320				439	809
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	350	246	71			
Volume Left	39	0	32			
Volume Right	0	32	39			
cSH	1320	1700	586			
Volume to Capacity	0.03	0.14	0.12			
Queue Length 95th (m)	0.7	0.0	3.3			
Control Delay (s)	1.1	0.0	12.0			
Lane LOS	A		B			
Approach Delay (s)	1.1	0.0	12.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			43.0%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	38	776	19	35	546
Future Volume (Veh/h)	3	38	776	19	35	546
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	41	843	21	38	593
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			169			
pX, platoon unblocked	0.49	0.49			0.49	
vC, conflicting volume	1522	854			864	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1546	173			194	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	90			94	
cM capacity (veh/h)	58	424			672	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	44	864	631			
Volume Left	3	0	38			
Volume Right	41	21	0			
cSH	296	1700	672			
Volume to Capacity	0.15	0.51	0.06			
Queue Length 95th (m)	4.1	0.0	1.4			
Control Delay (s)	19.3	0.0	1.5			
Lane LOS	C		A			
Approach Delay (s)	19.3	0.0	1.5			
Approach LOS	C					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			72.3%	ICU Level of Service		C
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
24: Mill Street & Street C

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	228	149	11	7	77
Future Volume (Veh/h)	88	228	149	11	7	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	248	162	12	8	84
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	174				608	168
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				608	168
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	90
cM capacity (veh/h)	1403				428	876
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	344	174	92			
Volume Left	96	0	8			
Volume Right	0	12	84			
cSH	1403	1700	803			
Volume to Capacity	0.07	0.10	0.11			
Queue Length 95th (m)	1.8	0.0	3.1			
Control Delay (s)	2.6	0.0	10.1			
Lane LOS	A		B			
Approach Delay (s)	2.6	0.0	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			40.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	19	175	39	48	184
Future Volume (Veh/h)	35	19	175	39	48	184
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	21	190	42	52	200
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	515	211			232	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	515	211			232	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	97			96	
cM capacity (veh/h)	500	829			1336	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	59	232	252			
Volume Left	38	0	52			
Volume Right	21	42	0			
cSH	582	1700	1336			
Volume to Capacity	0.10	0.14	0.04			
Queue Length 95th (m)	2.7	0.0	1.0			
Control Delay (s)	11.9	0.0	1.9			
Lane LOS	B		A			
Approach Delay (s)	11.9	0.0	1.9			
Approach LOS	B					
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		37.3%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
27: 10th Line & 4-Plex Driveway

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	3	3	28	38	3
Future Volume (Veh/h)	3	3	3	28	38	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	3	30	41	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	78	42	44			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78	42	44			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	922	1028	1564			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	6	33	44			
Volume Left	3	3	0			
Volume Right	3	0	3			
cSH	972	1564	1700			
Volume to Capacity	0.01	0.00	0.03			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.7	0.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	0.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization		14.0%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
29: 10th Line & Street A

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	7	11	24	30	11
Future Volume (Veh/h)	7	7	11	24	30	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	8	12	26	33	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	89	39	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89	39	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	905	1033	1563			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	16	38	45			
Volume Left	8	12	0			
Volume Right	8	0	12			
cSH	964	1563	1700			
Volume to Capacity	0.02	0.01	0.03			
Queue Length 95th (m)	0.4	0.2	0.0			
Control Delay (s)	8.8	2.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	2.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization		18.5%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2034 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	6	3	49	10	66	6	142	59	71	128	19
Future Volume (vph)	11	6	3	49	10	66	6	142	59	71	128	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	7	3	53	11	72	7	154	64	77	139	21
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	22	136	225	237								
Volume Left (vph)	12	53	7	77								
Volume Right (vph)	3	72	64	21								
Hadj (s)	0.06	-0.21	-0.13	0.05								
Departure Headway (s)	5.2	4.8	4.5	4.6								
Degree Utilization, x	0.03	0.18	0.28	0.30								
Capacity (veh/h)	610	683	773	745								
Control Delay (s)	8.4	8.8	9.2	9.6								
Approach Delay (s)	8.4	8.8	9.2	9.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.2									
Level of Service			A									
Intersection Capacity Utilization			41.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2034 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	117	3	2	100	38	1	0	1	21	1	24
Future Volume (Veh/h)	33	117	3	2	100	38	1	0	1	21	1	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	127	3	2	109	41	1	0	1	23	1	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	150			130			360	354	128	335	336	130
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150			130			360	354	128	335	336	130
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	100	96	100	97
cM capacity (veh/h)	1431			1455			566	556	921	605	570	920
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	166	152	2	50								
Volume Left	36	2	1	23								
Volume Right	3	41	1	26								
cSH	1431	1455	701	735								
Volume to Capacity	0.03	0.00	0.00	0.07								
Queue Length 95th (m)	0.6	0.0	0.1	1.7								
Control Delay (s)	1.8	0.1	10.1	10.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.8	0.1	10.1	10.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			29.2%	ICU Level of Service					A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2034 Future Total Traffic Volumes
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↗	
Traffic Volume (veh/h)	653	9	33	604	6	24
Future Volume (Veh/h)	653	9	33	604	6	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	710	10	36	657	7	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			720		1444	715
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			720		1444	715
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		95	94
cM capacity (veh/h)			882		139	431
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	720	693	33			
Volume Left	0	36	7			
Volume Right	10	0	26			
cSH	1700	882	298			
Volume to Capacity	0.42	0.04	0.11			
Queue Length 95th (m)	0.0	1.0	3.0			
Control Delay (s)	0.0	1.1	18.6			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.1	18.6			
Approach LOS			C			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			73.8%	ICU Level of Service		D
Analysis Period (min)			15			

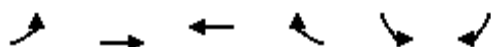
Norwood-Upper Mill Pond Development
39: 67 Mill St. Access A & Mill Street

2034 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	184	51	9	130	30	5
Future Volume (Veh/h)	184	51	9	130	30	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	200	55	10	141	33	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			255		388	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			255		388	228
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	99
cM capacity (veh/h)			1310		610	812
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	255	151	38			
Volume Left	0	10	33			
Volume Right	55	0	5			
cSH	1700	1310	631			
Volume to Capacity	0.15	0.01	0.06			
Queue Length 95th (m)	0.0	0.2	1.5			
Control Delay (s)	0.0	0.6	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			24.2%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
41: Mill Street & 112 Mill St. Access A

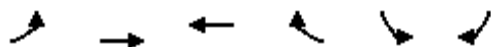
2034 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	183	135	1	1	4
Future Volume (Veh/h)	6	183	135	1	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	199	147	1	1	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	148				360	148
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148				360	148
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1434				635	899
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	206	148	5			
Volume Left	7	0	1			
Volume Right	0	1	4			
cSH	1434	1700	830			
Volume to Capacity	0.00	0.09	0.01			
Queue Length 95th (m)	0.1	0.0	0.1			
Control Delay (s)	0.3	0.0	9.4			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			24.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
43: Mill Street & 112 Mill St. Access B

2034 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	160	123	4	2	13
Future Volume (Veh/h)	23	160	123	4	2	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	174	134	4	2	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	138				360	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138				360	136
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1446				628	913
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	199	138	16			
Volume Left	25	0	2			
Volume Right	0	4	14			
cSH	1446	1700	864			
Volume to Capacity	0.02	0.08	0.02			
Queue Length 95th (m)	0.4	0.0	0.5			
Control Delay (s)	1.1	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	1.1	0.0	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			29.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

45: 67 Mill St. Access B/112 Mill St. Access C & Mill Street

2034 Future Total Traffic Volumes

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	37	90	14	48	6	58	0	8	4	0	21
Future Volume (Veh/h)	35	37	90	14	48	6	58	0	8	4	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	40	98	15	52	7	63	0	9	4	0	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	59			138			274	254	89	260	300	56
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			138			274	254	89	260	300	56
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			90	100	99	99	100	98
cM capacity (veh/h)	1545			1446			646	627	969	669	591	1011
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	176	74	72	27								
Volume Left	38	15	63	4								
Volume Right	98	7	9	23								
cSH	1545	1446	674	940								
Volume to Capacity	0.02	0.01	0.11	0.03								
Queue Length 95th (m)	0.6	0.3	2.9	0.7								
Control Delay (s)	1.8	1.6	11.0	8.9								
Lane LOS	A	A	B	A								
Approach Delay (s)	1.8	1.6	11.0	8.9								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			29.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Total Traffic Volumes
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	340	129	26	453	17	305	77	32	37	81	91
Future Volume (vph)	33	340	129	26	453	17	305	77	32	37	81	91
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98		0.99	1.00		0.98	0.99			0.97	
Frt		0.959			0.995			0.956			0.941	
Flt Protected	0.950			0.950			0.950				0.991	
Satd. Flow (prot)	1397	1426	0	1458	1568	0	1599	1627	0	0	1543	0
Flt Permitted	0.379			0.379			0.395				0.916	
Satd. Flow (perm)	555	1426	0	574	1568	0	652	1627	0	0	1421	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			2			21			32	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Adj. Flow (vph)	36	370	140	28	492	18	332	84	35	40	88	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	510	0	28	510	0	332	119	0	0	227	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Total Traffic Volumes
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8				4
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		37.4	33.9			19.9	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.35	0.32			0.19	
v/c Ratio	0.12	0.63		0.09	0.58		1.02	0.22			0.78	
Control Delay	14.1	20.5		13.6	19.5		86.6	22.2			53.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	14.1	20.5		13.6	19.5		86.6	22.2			53.6	
LOS	B	C		B	B		F	C			D	
Approach Delay		20.0			19.2			69.6			53.6	
Approach LOS		C			B			E			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 106.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 36.8

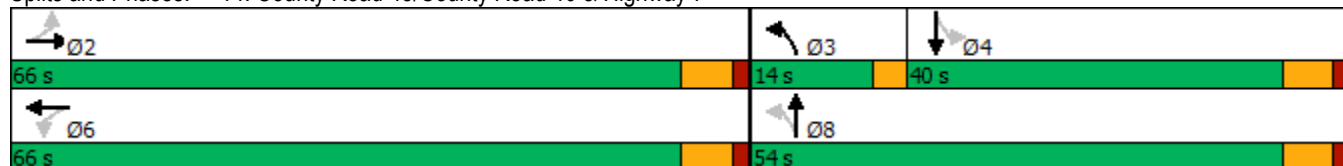
Intersection LOS: D

Intersection Capacity Utilization 77.5%

ICU Level of Service D

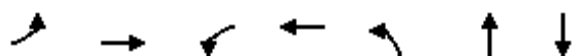
Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Total Traffic Volumes
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	36	510	28	510	332	119	227
v/c Ratio	0.12	0.63	0.09	0.58	1.02	0.22	0.78
Control Delay	14.1	20.5	13.6	19.5	86.6	22.2	53.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	20.5	13.6	19.5	86.6	22.2	53.6
Queue Length 50th (m)	3.5	67.5	2.6	67.4	~60.2	15.4	41.0
Queue Length 95th (m)	10.8	126.2	8.6	121.9	#118.5	29.3	68.5
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	313	814	323	885	326	740	471
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.63	0.09	0.58	1.02	0.16	0.48

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.

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	340	129	26	453	17	305	77	32	37	81	91
Future Volume (vph)	33	340	129	26	453	17	305	77	32	37	81	91
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00			1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.96			0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1390	1427		1438	1568		1589	1628			1542	
Flt Permitted	0.38	1.00		0.38	1.00		0.39	1.00			0.92	
Satd. Flow (perm)	554	1427		573	1568		660	1628			1424	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	370	140	28	492	18	332	84	35	40	88	99
RTOR Reduction (vph)	0	10	0	0	1	0	0	14	0	0	26	0
Lane Group Flow (vph)	36	500	0	28	509	0	332	105	0	0	201	0
Confl. Peds. (#/hr)	6		18	18		6	12		8	8		12
Heavy Vehicles (%)	19%	19%	7%	14%	11%	8%	4%	2%	0%	9%	0%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		33.9	33.9			19.9	
Effective Green, g (s)	60.1	60.1		60.1	60.1		33.9	33.9			19.9	
Actuated g/C Ratio	0.56	0.56		0.56	0.56		0.32	0.32			0.19	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	312	805		323	884		306	518			266	
v/s Ratio Prot		c0.35			0.32		c0.11	0.06				
v/s Ratio Perm	0.06			0.05			c0.23				0.14	
v/c Ratio	0.12	0.62		0.09	0.58		1.08	0.20			0.76	
Uniform Delay, d1	10.8	15.6		10.6	15.0		35.8	26.4			41.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.8	3.6		0.5	2.7		76.0	0.2			11.5	
Delay (s)	11.6	19.2		11.2	17.7		111.9	26.6			52.5	
Level of Service	B	B		B	B		F	C			D	
Approach Delay (s)		18.7			17.4			89.4			52.5	
Approach LOS		B			B			F			D	
Intersection Summary												
HCM 2000 Control Delay			40.7			HCM 2000 Level of Service					D	
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			106.5			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			77.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	73	380	0	0	506
Future Volume (Veh/h)	25	73	380	0	0	506
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	79	413	0	0	550
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	963	413			413	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	963	413			413	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	88			100	
cM capacity (veh/h)	286	643			1157	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	106	413	550			
Volume Left	27	0	0			
Volume Right	79	0	0			
cSH	488	1700	1157			
Volume to Capacity	0.22	0.24	0.00			
Queue Length 95th (m)	6.5	0.0	0.0			
Control Delay (s)	14.4	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	14.4	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		41.5%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	40	18	16	23	5
Future Volume (Veh/h)	12	40	18	16	23	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	43	20	17	25	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	84	28	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	84	28	30			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	96	99			
cM capacity (veh/h)	905	1048	1583			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	56	37	30			
Volume Left	13	20	0			
Volume Right	43	0	5			
cSH	1011	1583	1700			
Volume to Capacity	0.06	0.01	0.02			
Queue Length 95th (m)	1.4	0.3	0.0			
Control Delay (s)	8.8	4.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	4.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		5.2				
Intersection Capacity Utilization		18.5%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
7: King Street/Street A & Mill Street

2039 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	22	2	132	153	3	1	50	87	5	65	52
Future Volume (Veh/h)	5	22	2	132	153	3	1	50	87	5	65	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	24	2	143	166	3	1	54	95	5	71	57
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	169			26			581	490	25	610	490	168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	169			26			581	490	25	610	490	168
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			100	88	91	98	84	93
cM capacity (veh/h)	1409			1588			323	434	1051	311	435	877
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	31	312	150	133								
Volume Left	5	143	1	5								
Volume Right	2	3	95	57								
cSH	1409	1588	689	544								
Volume to Capacity	0.00	0.09	0.22	0.24								
Queue Length 95th (m)	0.1	2.4	6.6	7.6								
Control Delay (s)	1.2	3.8	11.7	13.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.2	3.8	11.7	13.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			39.0%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	14	367	37	43	489
Future Volume (Veh/h)	34	14	367	37	43	489
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	15	399	40	47	532
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			376			
pX, platoon unblocked						
vC, conflicting volume	1045	419			439	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1045	419			439	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	98			96	
cM capacity (veh/h)	243	634			1121	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	52	439	47	532		
Volume Left	37	0	47	0		
Volume Right	15	40	0	0		
cSH	295	1700	1121	1700		
Volume to Capacity	0.18	0.26	0.04	0.31		
Queue Length 95th (m)	5.0	0.0	1.0	0.0		
Control Delay (s)	19.8	0.0	8.4	0.0		
Lane LOS	C		A			
Approach Delay (s)	19.8	0.0	0.7			
Approach LOS	C					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			40.1%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2039 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	24	0	14	0	390	36	32	491	0
Future Volume (Veh/h)	0	0	0	24	0	14	0	390	36	32	491	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	26	0	15	0	424	39	35	534	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked												
vC, conflicting volume	1062	1067	534	1048	1048	444	534			463		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1062	1067	534	1048	1048	444	534			463		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	87	100	98	100			97		
cM capacity (veh/h)	191	215	546	201	221	614	1034			1098		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	41	463	35	534							
Volume Left	0	26	0	35	0							
Volume Right	0	15	39	0	0							
cSH	1700	267	1034	1098	1700							
Volume to Capacity	0.00	0.15	0.00	0.03	0.31							
Queue Length 95th (m)	0.0	4.3	0.0	0.8	0.0							
Control Delay (s)	0.0	20.9	0.0	8.4	0.0							
Lane LOS	A	C		A								
Approach Delay (s)	0.0	20.9	0.0	0.5								
Approach LOS	A	C										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			38.9%			ICU Level of Service			A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	29	269	145	26	94	141
Future Volume (Veh/h)	29	269	145	26	94	141
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	292	158	28	102	153
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	515	158			158	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	515	158			158	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	67			93	
cM capacity (veh/h)	483	887			1422	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	324	158	28	255		
Volume Left	32	0	0	102		
Volume Right	292	0	28	0		
cSH	819	1700	1700	1422		
Volume to Capacity	0.40	0.09	0.02	0.07		
Queue Length 95th (m)	15.2	0.0	0.0	1.9		
Control Delay (s)	12.2	0.0	0.0	3.5		
Lane LOS	B			A		
Approach Delay (s)	12.2	0.0		3.5		
Approach LOS	B					
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			48.5%		ICU Level of Service	A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
20: Mill Street & Street C

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	76	182	4	10	106
Future Volume (Veh/h)	32	76	182	4	10	106
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	83	198	4	11	115
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	202				353	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	202				353	200
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				98	86
cM capacity (veh/h)	1370				628	841
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	118	202	126			
Volume Left	35	0	11			
Volume Right	0	4	115			
cSH	1370	1700	817			
Volume to Capacity	0.03	0.12	0.15			
Queue Length 95th (m)	0.6	0.0	4.4			
Control Delay (s)	2.4	0.0	10.2			
Lane LOS	A		B			
Approach Delay (s)	2.4	0.0	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			32.7%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	9	29	397	12	29	486
Future Volume (Veh/h)	9	29	397	12	29	486
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	32	432	13	32	528
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			169			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1030	438			445	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	968	297			304	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	95			97	
cM capacity (veh/h)	241	655			1109	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	42	445	560			
Volume Left	10	0	32			
Volume Right	32	13	0			
cSH	465	1700	1109			
Volume to Capacity	0.09	0.26	0.03			
Queue Length 95th (m)	2.4	0.0	0.7			
Control Delay (s)	13.5	0.0	0.8			
Lane LOS	B		A			
Approach Delay (s)	13.5	0.0	0.8			
Approach LOS	B					
Intersection Summary						
Average Delay		1.0				
Intersection Capacity Utilization		63.5%		ICU Level of Service		B
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
24: Mill Street & Commercial Driveway

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	100	276	13	8	10
Future Volume (Veh/h)	15	100	276	13	8	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	109	300	14	9	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	314				448	307
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	314				448	307
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1246				561	733
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	125	314	20			
Volume Left	16	0	9			
Volume Right	0	14	11			
cSH	1246	1700	644			
Volume to Capacity	0.01	0.18	0.03			
Queue Length 95th (m)	0.3	0.0	0.8			
Control Delay (s)	1.1	0.0	10.8			
Lane LOS	A		B			
Approach Delay (s)	1.1	0.0	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization		27.9%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	48	123	57	77	94
Future Volume (Veh/h)	56	48	123	57	77	94
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	52	134	62	84	102
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	435	165			196	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	435	165			196	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	94			94	
cM capacity (veh/h)	543	879			1377	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	113	196	186			
Volume Left	61	0	84			
Volume Right	52	62	0			
cSH	659	1700	1377			
Volume to Capacity	0.17	0.12	0.06			
Queue Length 95th (m)	4.9	0.0	1.6			
Control Delay (s)	11.6	0.0	3.8			
Lane LOS	B		A			
Approach Delay (s)	11.6	0.0	3.8			
Approach LOS	B					
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		35.2%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
27: 10th Line & Street A

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	10	4	24	18	4
Future Volume (Veh/h)	10	10	4	24	18	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	11	4	26	20	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	56	22	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	56	22	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	949	1055	1591			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	22	30	24			
Volume Left	11	4	0			
Volume Right	11	0	4			
cSH	999	1591	1700			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (m)	0.5	0.1	0.0			
Control Delay (s)	8.7	1.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	1.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		2.9				
Intersection Capacity Utilization		14.7%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
29: 10th Line & 4-Plex Driveway

2039 Future Total Traffic Volumes
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	3	1	33	19	1
Future Volume (Veh/h)	3	3	1	33	19	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	1	36	21	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	60	22	22			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	60	22	22			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	947	1056	1593			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	6	37	22			
Volume Left	3	1	0			
Volume Right	3	0	1			
cSH	998	1593	1700			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.6	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.6	0.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2039 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	32	9	7	50	8	54	6	71	36	53	101	20
Future Volume (vph)	32	9	7	50	8	54	6	71	36	53	101	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	10	8	54	9	59	7	77	39	58	110	22
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	53	122	123	190								
Volume Left (vph)	35	54	7	58								
Volume Right (vph)	8	59	39	22								
Hadj (s)	0.08	-0.17	-0.14	0.03								
Departure Headway (s)	4.9	4.5	4.4	4.5								
Degree Utilization, x	0.07	0.15	0.15	0.24								
Capacity (veh/h)	680	736	774	761								
Control Delay (s)	8.2	8.3	8.2	8.9								
Approach Delay (s)	8.2	8.3	8.2	8.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			29.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2039 Future Total Traffic Volumes
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	75	0	0	93	13	4	0	2	30	1	33
Future Volume (Veh/h)	20	75	0	0	93	13	4	0	2	30	1	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	82	0	0	101	14	4	0	2	33	1	36
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	115			82			270	241	82	236	234	108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			82			270	241	82	236	234	108
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	100	100	95	100	96
cM capacity (veh/h)	1474			1515			648	651	978	709	656	946
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	104	115	6	70								
Volume Left	22	0	4	33								
Volume Right	0	14	2	36								
cSH	1474	1515	730	813								
Volume to Capacity	0.01	0.00	0.01	0.09								
Queue Length 95th (m)	0.4	0.0	0.2	2.3								
Control Delay (s)	1.7	0.0	10.0	9.8								
Lane LOS	A		A	A								
Approach Delay (s)	1.7	0.0	10.0	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			22.4%	ICU Level of Service					A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2039 Future Total Traffic Volumes
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	
Traffic Volume (veh/h)	402	8	12	459	7	28
Future Volume (Veh/h)	402	8	12	459	7	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	437	9	13	499	8	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			446		966	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			446		966	442
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	95
cM capacity (veh/h)			1114		279	616
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	446	512	38			
Volume Left	0	13	8			
Volume Right	9	0	30			
cSH	1700	1114	491			
Volume to Capacity	0.26	0.01	0.08			
Queue Length 95th (m)	0.0	0.3	2.0			
Control Delay (s)	0.0	0.3	12.9			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.3	12.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			46.7%	ICU Level of Service		A
Analysis Period (min)			15			

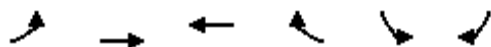
Norwood-Upper Mill Pond Development
39: 67 Mill St. Access Rd. A & Mill Street

2039 Future Total Traffic Volumes
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	70	16	2	142	44	8
Future Volume (Veh/h)	70	16	2	142	44	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	17	2	154	48	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			93		242	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			93		242	84
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1501		745	975
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	93	156	57			
Volume Left	0	2	48			
Volume Right	17	0	9			
cSH	1700	1501	774			
Volume to Capacity	0.05	0.00	0.07			
Queue Length 95th (m)	0.0	0.0	1.9			
Control Delay (s)	0.0	0.1	10.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.1	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			19.1%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
41: Mill Street & 112 Mill St. Access Rd. A

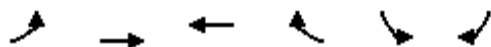
2039 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	76	139	0	1	6
Future Volume (Veh/h)	2	76	139	0	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	83	151	0	1	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	151				238	151
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	151				238	151
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1430				749	895
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	85	151	8			
Volume Left	2	0	1			
Volume Right	0	0	7			
cSH	1430	1700	874			
Volume to Capacity	0.00	0.09	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.2	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
43: Mill Street & 112 Mill St. Access B

2039 Future Total Traffic Volumes
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	70	119	1	3	20
Future Volume (Veh/h)	7	70	119	1	3	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	76	129	1	3	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	130				222	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130				222	130
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1455				762	920
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	84	130	25			
Volume Left	8	0	3			
Volume Right	0	1	22			
cSH	1455	1700	898			
Volume to Capacity	0.01	0.08	0.03			
Queue Length 95th (m)	0.1	0.0	0.7			
Control Delay (s)	0.8	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.8	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			19.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

2039 Future Total Traffic Volumes

45: 67 Mill St. Access B/112 Mill St. Access C & Mill Street

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	35	28	4	17	2	72	0	12	5	0	31
Future Volume (Veh/h)	11	35	28	4	17	2	72	0	12	5	0	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	38	30	4	18	2	78	0	13	5	0	34
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	20			68			138	105	53	117	119	19
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	20			68			138	105	53	117	119	19
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			90	100	99	99	100	97
cM capacity (veh/h)	1596			1533			800	777	1014	842	763	1059
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	80	24	91	39								
Volume Left	12	4	78	5								
Volume Right	30	2	13	34								
cSH	1596	1533	825	1025								
Volume to Capacity	0.01	0.00	0.11	0.04								
Queue Length 95th (m)	0.2	0.1	3.0	0.9								
Control Delay (s)	1.1	1.2	9.9	8.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.1	1.2	9.9	8.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			5.8									
Intersection Capacity Utilization			23.4%	ICU Level of Service					A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Total Traffic Volumes
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	735	275	33	498	44	244	109	38	57	113	73
Future Volume (vph)	120	735	275	33	498	44	244	109	38	57	113	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	15.0		15.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			1.00		0.98	0.99			0.98	
Frt		0.959			0.988			0.961			0.960	
Flt Protected	0.950			0.950			0.950				0.988	
Satd. Flow (prot)	1662	1605	0	1662	1553	0	1568	1623	0	0	1571	0
Flt Permitted	0.305			0.067			0.412				0.873	
Satd. Flow (perm)	532	1605	0	117	1553	0	668	1623	0	0	1387	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			5			17			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		284.8			168.9			203.4			79.8	
Travel Time (s)		20.5			12.2			14.6			5.7	
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Adj. Flow (vph)	130	799	299	36	541	48	265	118	41	62	123	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1098	0	36	589	0	265	159	0	0	264	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Total Traffic Volumes
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		7.0	10.0		10.0	10.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		11.0	32.0		32.0	32.0	
Total Split (s)	66.0	66.0		66.0	66.0		14.0	54.0		40.0	40.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		11.7%	45.0%		33.3%	33.3%	
Maximum Green (s)	59.9	59.9		59.9	59.9		11.0	47.6		33.6	33.6	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.0	4.5		4.5	4.5	
All-Red Time (s)	1.6	1.6		1.6	1.6		0.0	1.9		1.9	1.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lead/Lag							Lead			Lag	Lag	
Lead-Lag Optimize?							Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0		7.0	7.0	
Flash Dont Walk (s)	18.0	18.0		18.0	18.0			10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effect Green (s)	60.1	60.1		60.1	60.1		41.8	38.3			24.3	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.38	0.35			0.22	
v/c Ratio	0.45	1.25		0.57	0.70		0.78	0.28			0.83	
Control Delay	23.8	147.3		60.1	25.6		43.8	24.2			60.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	23.8	147.3		60.1	25.6		43.8	24.2			60.3	
LOS	C	F		E	C		D	C			E	
Approach Delay		134.2			27.6			36.4			60.3	
Approach LOS		F			C			D			E	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 111

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 84.0

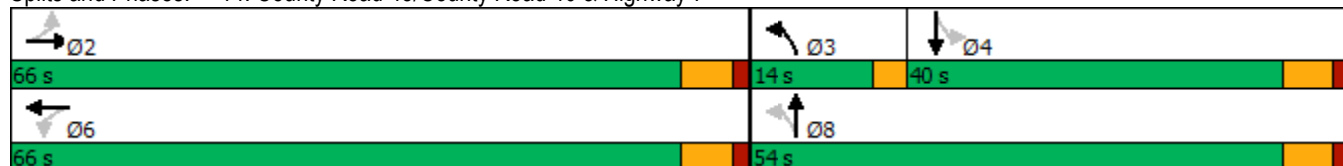
Intersection LOS: F

Intersection Capacity Utilization 127.6%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 14: County Road 45/County Road 40 & Highway 7



Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Total Traffic Volumes
PM Peak Hour

							
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	130	1098	36	589	265	159	264
v/c Ratio	0.45	1.25	0.57	0.70	0.78	0.28	0.83
Control Delay	23.8	147.3	60.1	25.6	43.8	24.2	60.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	147.3	60.1	25.6	43.8	24.2	60.3
Queue Length 50th (m)	17.3	~313.9	5.2	94.5	44.7	23.0	54.0
Queue Length 95th (m)	41.8	#439.9	#26.7	163.2	#69.5	39.6	85.1
Internal Link Dist (m)		260.8		144.9		179.4	55.8
Turn Bay Length (m)	40.0		50.0		15.0		
Base Capacity (vph)	288	879	63	843	340	708	434
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	1.25	0.57	0.70	0.78	0.22	0.61

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.

Norwood-Upper Mill Pond Development
14: County Road 45/County Road 40 & Highway 7

2039 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	735	275	33	498	44	244	109	38	57	113	73
Future Volume (vph)	120	735	275	33	498	44	244	109	38	57	113	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1656	1606		1662	1553		1559	1624			1572	
Flt Permitted	0.31	1.00		0.07	1.00		0.41	1.00			0.87	
Satd. Flow (perm)	532	1606		116	1553		676	1624			1388	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	799	299	36	541	48	265	118	41	62	123	79
RTOR Reduction (vph)	0	10	0	0	2	0	0	11	0	0	14	0
Lane Group Flow (vph)	130	1088	0	36	587	0	265	148	0	0	250	0
Confl. Peds. (#/hr)	6		4	4		6	13		1	1		13
Heavy Vehicles (%)	0%	4%	3%	0%	12%	0%	6%	3%	3%	5%	2%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.1	60.1		60.1	60.1		38.3	38.3			24.3	
Effective Green, g (s)	60.1	60.1		60.1	60.1		38.3	38.3			24.3	
Actuated g/C Ratio	0.54	0.54		0.54	0.54		0.35	0.35			0.22	
Clearance Time (s)	6.1	6.1		6.1	6.1		3.0	6.4			6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	288	870		62	841		321	560			304	
v/s Ratio Prot		c0.68			0.38		c0.08	0.09				
v/s Ratio Perm	0.24			0.31			c0.20				0.18	
v/c Ratio	0.45	1.25		0.58	0.70		0.83	0.26			0.82	
Uniform Delay, d1	15.4	25.4		17.0	18.7		33.1	26.1			41.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	5.0	122.2		34.1	4.8		15.7	0.3			16.2	
Delay (s)	20.4	147.6		51.0	23.5		48.8	26.4			57.5	
Level of Service	C	F		D	C		D	C			E	
Approach Delay (s)		134.2			25.1			40.4			57.5	
Approach LOS		F			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			83.7			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.12									
Actuated Cycle Length (s)			110.9			Sum of lost time (s)			15.5			
Intersection Capacity Utilization			127.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

Norwood-Upper Mill Pond Development
3: Highway 7 & Mill Street

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	58	702	7	6	638
Future Volume (Veh/h)	20	58	702	7	6	638
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	63	763	8	7	693
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1474	767			771	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1474	767			771	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	84			99	
cM capacity (veh/h)	140	405			853	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	85	771	700			
Volume Left	22	0	7			
Volume Right	63	8	0			
cSH	272	1700	853			
Volume to Capacity	0.31	0.45	0.01			
Queue Length 95th (m)	10.4	0.0	0.2			
Control Delay (s)	24.2	0.0	0.2			
Lane LOS	C		A			
Approach Delay (s)	24.2	0.0	0.2			
Approach LOS	C					
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		53.0%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
4: 10th Line & Mill Street

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	35	51	21	22	17
Future Volume (Veh/h)	15	35	51	21	22	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	38	55	23	24	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	166	33	42			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	166	33	42			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	96	96			
cM capacity (veh/h)	796	1041	1567			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	54	78	42			
Volume Left	16	55	0			
Volume Right	38	0	18			
cSH	954	1567	1700			
Volume to Capacity	0.06	0.04	0.02			
Queue Length 95th (m)	1.4	0.9	0.0			
Control Delay (s)	9.0	5.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	5.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization		20.6%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
7: King Street/Street A & Mill Street

2039 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	58	6	104	120	9	11	136	257	8	44	35
Future Volume (Veh/h)	14	58	6	104	120	9	11	136	257	8	44	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	63	7	113	130	10	12	148	279	9	48	38
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	140			70			520	462	66	810	461	135
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140			70			520	462	66	810	461	135
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			93			97	67	72	94	89	96
cM capacity (veh/h)	1443			1531			386	455	997	151	456	914
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	85	253	439	95								
Volume Left	15	113	12	9								
Volume Right	7	10	279	38								
cSH	1443	1531	690	460								
Volume to Capacity	0.01	0.07	0.64	0.21								
Queue Length 95th (m)	0.3	1.9	36.6	6.1								
Control Delay (s)	1.4	3.7	18.9	14.9								
Lane LOS	A	A	C	B								
Approach Delay (s)	1.4	3.7	18.9	14.9								
Approach LOS			C	B								
Intersection Summary												
Average Delay			12.3									
Intersection Capacity Utilization			51.5%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
12: Highway 7 & Cedar Street

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	30	678	84	97	561
Future Volume (Veh/h)	30	30	678	84	97	561
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	33	737	91	105	610
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			376			
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	1602	782			828	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1684	209			291	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	33	93			85	
cM capacity (veh/h)	49	462			706	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	66	828	70	645		
Volume Left	33	0	70	35		
Volume Right	33	91	0	0		
cSH	89	1700	706	706		
Volume to Capacity	0.75	0.49	0.15	0.15		
Queue Length 95th (m)	30.1	0.0	4.2	4.2		
Control Delay (s)	118.5	0.0	11.0	3.0		
Lane LOS	F		B	A		
Approach Delay (s)	118.5	0.0	3.8			
Approach LOS	F					
Intersection Summary						
Average Delay			6.5			
Intersection Capacity Utilization			70.9%		ICU Level of Service	C
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
17: Highway 7 & Elm Street

2039 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	26	0	13	0	749	98	9	581	0
Future Volume (Veh/h)	0	0	0	26	0	13	0	749	98	9	581	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	28	0	14	0	814	107	10	632	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)								188				
pX, platoon unblocked	0.49	0.49		0.49	0.49	0.49				0.49		
vC, conflicting volume	1534	1573	632	1520	1520	868	632			921		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1568	1649	632	1540	1540	211	632			320		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	39	100	97	100			98		
cM capacity (veh/h)	42	48	480	46	56	407	951			608		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	42	921	10	632							
Volume Left	0	28	0	10	0							
Volume Right	0	14	107	0	0							
cSH	1700	65	951	608	1700							
Volume to Capacity	0.00	0.65	0.00	0.02	0.37							
Queue Length 95th (m)	0.0	22.3	0.0	0.4	0.0							
Control Delay (s)	0.0	131.2	0.0	11.0	0.0							
Lane LOS	A	F		B								
Approach Delay (s)	0.0	131.2	0.0	0.2								
Approach LOS	A	F										
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			59.3%			ICU Level of Service			B			
Analysis Period (min)			15									

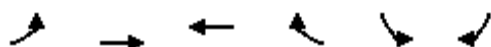
Norwood-Upper Mill Pond Development
19: County Road 45 & Alma Street

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	42	215	168	35	224	200
Future Volume (Veh/h)	42	215	168	35	224	200
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	234	183	38	243	217
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						203
pX, platoon unblocked						
vC, conflicting volume	886	183			183	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	886	183			183	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	73			83	
cM capacity (veh/h)	260	859			1392	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	280	183	38	460		
Volume Left	46	0	0	243		
Volume Right	234	0	38	0		
cSH	623	1700	1700	1392		
Volume to Capacity	0.45	0.11	0.02	0.17		
Queue Length 95th (m)	18.6	0.0	0.0	5.1		
Control Delay (s)	15.4	0.0	0.0	5.1		
Lane LOS	C			A		
Approach Delay (s)	15.4	0.0		5.1		
Approach LOS	C					
Intersection Summary						
Average Delay			6.9			
Intersection Capacity Utilization			57.4%		ICU Level of Service	B
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
20: Mill Street & Commercial Driveway

2039 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	36	287	198	29	29	36
Future Volume (Veh/h)	36	287	198	29	29	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	312	215	32	32	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	247				621	231
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	247				621	231
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				93	95
cM capacity (veh/h)	1319				438	808
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	351	247	71			
Volume Left	39	0	32			
Volume Right	0	32	39			
cSH	1319	1700	585			
Volume to Capacity	0.03	0.15	0.12			
Queue Length 95th (m)	0.7	0.0	3.3			
Control Delay (s)	1.1	0.0	12.0			
Lane LOS	A		B			
Approach Delay (s)	1.1	0.0	12.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			43.1%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
22: Highway 7 & Victoria Street

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	40	809	20	36	570
Future Volume (Veh/h)	4	40	809	20	36	570
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	43	879	22	39	620
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			169			
pX, platoon unblocked	0.48	0.48			0.48	
vC, conflicting volume	1588	890			901	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1681	242			265	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	89			94	
cM capacity (veh/h)	47	386			630	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	47	901	659			
Volume Left	4	0	39			
Volume Right	43	22	0			
cSH	240	1700	630			
Volume to Capacity	0.20	0.53	0.06			
Queue Length 95th (m)	5.7	0.0	1.6			
Control Delay (s)	23.6	0.0	1.7			
Lane LOS	C		A			
Approach Delay (s)	23.6	0.0	1.7			
Approach LOS	C					
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		74.6%		ICU Level of Service		D
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
24: Mill Street & Street C

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	88	228	149	11	7	77
Future Volume (Veh/h)	88	228	149	11	7	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	248	162	12	8	84
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	174				608	168
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				608	168
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				98	90
cM capacity (veh/h)	1403				428	876
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	344	174	92			
Volume Left	96	0	8			
Volume Right	0	12	84			
cSH	1403	1700	803			
Volume to Capacity	0.07	0.10	0.11			
Queue Length 95th (m)	1.8	0.0	3.1			
Control Delay (s)	2.6	0.0	10.1			
Lane LOS	A		B			
Approach Delay (s)	2.6	0.0	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			40.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
26: County Road 45 & Queen Street

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	20	183	40	50	193
Future Volume (Veh/h)	36	20	183	40	50	193
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	22	199	43	54	210
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						365
pX, platoon unblocked						
vC, conflicting volume	538	220			242	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	538	220			242	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	97			96	
cM capacity (veh/h)	483	819			1324	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	61	242	264			
Volume Left	39	0	54			
Volume Right	22	43	0			
cSH	567	1700	1324			
Volume to Capacity	0.11	0.14	0.04			
Queue Length 95th (m)	2.9	0.0	1.0			
Control Delay (s)	12.1	0.0	1.9			
Lane LOS	B		A			
Approach Delay (s)	12.1	0.0	1.9			
Approach LOS	B					
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		38.3%	ICU Level of Service	A		
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
27: 10th Line & 4-Plex Driveway

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	3	3	29	40	3
Future Volume (Veh/h)	3	3	3	29	40	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	3	32	43	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	82	44	46			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82	44	46			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	918	1025	1562			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	6	35	46			
Volume Left	3	3	0			
Volume Right	3	0	3			
cSH	969	1562	1700			
Volume to Capacity	0.01	0.00	0.03			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.7	0.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	0.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization		14.0%		ICU Level of Service		A
Analysis Period (min)		15				

Norwood-Upper Mill Pond Development
29: 10th Line & Street A

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	7	11	24	31	11
Future Volume (Veh/h)	7	7	11	24	31	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	8	12	26	34	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	90	40	46			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	90	40	46			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	903	1031	1562			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	16	38	46			
Volume Left	8	12	0			
Volume Right	8	0	12			
cSH	963	1562	1700			
Volume to Capacity	0.02	0.01	0.03			
Queue Length 95th (m)	0.4	0.2	0.0			
Control Delay (s)	8.8	2.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	2.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization		18.5%		ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
31: County Road 45 & Birch Street/County Road 42

2039 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	6	4	50	11	69	6	147	61	75	133	20
Future Volume (vph)	12	6	4	50	11	69	6	147	61	75	133	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	7	4	54	12	75	7	160	66	82	145	22
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	24	141	233	249								
Volume Left (vph)	13	54	7	82								
Volume Right (vph)	4	75	66	22								
Hadj (s)	0.04	-0.21	-0.13	0.05								
Departure Headway (s)	5.3	4.8	4.5	4.6								
Degree Utilization, x	0.04	0.19	0.29	0.32								
Capacity (veh/h)	602	674	765	739								
Control Delay (s)	8.5	9.0	9.3	9.8								
Approach Delay (s)	8.5	9.0	9.3	9.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.4									
Level of Service			A									
Intersection Capacity Utilization			42.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
34: 10th Line & County Road 42

2039 Future Total Traffic Volumes
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	123	4	2	106	39	1	0	1	21	1	25
Future Volume (Veh/h)	33	123	4	2	106	39	1	0	1	21	1	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	134	4	2	115	42	1	0	1	23	1	27
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	157			138			376	369	136	349	350	136
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	157			138			376	369	136	349	350	136
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	100	96	100	97
cM capacity (veh/h)	1423			1446			552	545	913	593	559	913
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	174	159	2	51								
Volume Left	36	2	1	23								
Volume Right	4	42	1	27								
cSH	1423	1446	688	727								
Volume to Capacity	0.03	0.00	0.00	0.07								
Queue Length 95th (m)	0.6	0.0	0.1	1.8								
Control Delay (s)	1.7	0.1	10.2	10.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.7	0.1	10.2	10.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			29.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Norwood-Upper Mill Pond Development
35: 10th Line & Highway 7

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	684	9	33	631	6	25
Future Volume (Veh/h)	684	9	33	631	6	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	743	10	36	686	7	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			753		1506	748
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			753		1506	748
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		95	93
cM capacity (veh/h)			857		128	412
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	753	722	34			
Volume Left	0	36	7			
Volume Right	10	0	27			
cSH	1700	857	283			
Volume to Capacity	0.44	0.04	0.12			
Queue Length 95th (m)	0.0	1.1	3.2			
Control Delay (s)	0.0	1.1	19.5			
Lane LOS		A	C			
Approach Delay (s)	0.0	1.1	19.5			
Approach LOS			C			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			75.3%	ICU Level of Service		D
Analysis Period (min)			15			

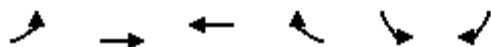
Norwood-Upper Mill Pond Development
39: 67 Mill St. Access A & Mill Street

2039 Future Total Traffic Volumes
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	184	51	9	130	30	5
Future Volume (Veh/h)	184	51	9	130	30	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	200	55	10	141	33	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			255		388	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			255		388	228
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	99
cM capacity (veh/h)			1310		610	812
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	255	151	38			
Volume Left	0	10	33			
Volume Right	55	0	5			
cSH	1700	1310	631			
Volume to Capacity	0.15	0.01	0.06			
Queue Length 95th (m)	0.0	0.2	1.5			
Control Delay (s)	0.0	0.6	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.6	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			24.2%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
41: Mill Street & 112 Mill St. Access A

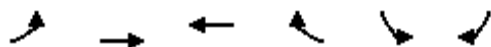
2039 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	183	135	1	1	4
Future Volume (Veh/h)	6	183	135	1	1	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	199	147	1	1	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	148				360	148
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148				360	148
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1434				635	899
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	206	148	5			
Volume Left	7	0	1			
Volume Right	0	1	4			
cSH	1434	1700	830			
Volume to Capacity	0.00	0.09	0.01			
Queue Length 95th (m)	0.1	0.0	0.1			
Control Delay (s)	0.3	0.0	9.4			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			24.5%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development
43: Mill Street & 112 Mill St. Access B

2039 Future Total Traffic Volumes
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	161	123	4	2	13
Future Volume (Veh/h)	23	161	123	4	2	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	175	134	4	2	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	138				361	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138				361	136
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1446				627	913
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	200	138	16			
Volume Left	25	0	2			
Volume Right	0	4	14			
cSH	1446	1700	863			
Volume to Capacity	0.02	0.08	0.02			
Queue Length 95th (m)	0.4	0.0	0.5			
Control Delay (s)	1.1	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	1.1	0.0	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			29.8%	ICU Level of Service		A
Analysis Period (min)			15			

Norwood-Upper Mill Pond Development

45: 67 Mill St. Access B/112 Mill St. Access C & Mill Street

2039 Future Total Traffic Volumes

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	38	90	14	48	6	58	0	8	4	0	21
Future Volume (Veh/h)	35	38	90	14	48	6	58	0	8	4	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	41	98	15	52	7	63	0	9	4	0	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	59			139			274	255	90	260	300	56
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			139			274	255	90	260	300	56
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			90	100	99	99	100	98
cM capacity (veh/h)	1545			1445			645	626	968	668	591	1011
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	177	74	72	27								
Volume Left	38	15	63	4								
Volume Right	98	7	9	23								
cSH	1545	1445	673	940								
Volume to Capacity	0.02	0.01	0.11	0.03								
Queue Length 95th (m)	0.6	0.3	2.9	0.7								
Control Delay (s)	1.7	1.6	11.0	8.9								
Lane LOS	A	A	B	A								
Approach Delay (s)	1.7	1.6	11.0	8.9								
Approach LOS			B	A								
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			29.9%	ICU Level of Service					A			
Analysis Period (min)			15									

APPENDIX E

TRAFFIC SIGNAL WARRANTS

(1) Justification 7 – Highway 7 and Cedar Street

Justification Table -2039 Total Traffic Volumes

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance		
		Free Flow**	Restr. Flow	Free Flow	Restr. Flow	Sectional		Entire %
						Numerical	%**	
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480 (720)	720	600	900	616	(86%)	
	B. Vehicle volume, along minor streets (average hour)	120 (180)	170	120	170	27	(15%)	
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	480 (720)	720	600	900	589	(82%)	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50 (75)	75	120	170	16	(21%)	

NOTE: AVH volumes used for analysis were estimated from the Peak Hour Volumes using the following relationships: $AHV = (am\ PHV + pm\ PHV)/4$

** under free flow and 1 lane, the AHV for Part 1A or 2A of Justification 7 must be met to $480 \times 1.50 = 720$ vph and $120 \times 1.50 = 180$ vph for Part 1B and $50 \times 1.50 = 75$ for Part 2B respectively.

2034 AM Peak Hour

		509		363		
0	0	466	43	13		47
		0		0		
				34		
0	0		0	350	36	79
		0				
		500		386		

Cedar Street

PM Peak Hour

		631		675		
0	0	535	96	29		58
		0		0		
				29		
0	0		0	646	83	179
		0				
		564		729		

Cedar Street

- A. Vehicle volume, all approaches (average hour)
 B. Vehicle volume, along minor streets (average hour)
 A. Vehicle volume, major street (average hour)
 B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)

AM Peak	PM Peak	Criteria
1A 942	1A 1418	590 720 82%
1B 47	1B 58	26 180 15%
2A 895	2A 1360	564 720 78%
2B 34	2B 29	16 75 21%

2039 AM Peak Hour

		532		381		
0	0	489	43	14		48
		0		0		
				34		
0	0		0	367	37	80
		0				
		523		404		

Cedar Street

PM Peak Hour

		658		709		
0	0	561	97	30		60
		0		0		
				30		
0	0		0	678	84	181
		0				
		591		762		

Cedar Street

AM Peak	PM Peak	Criteria
1A 984	1A 1480	616 720 86%
1B 48	1B 60	27 180 15%
2A 936	2A 1420	589 720 82%
2B 34	2B 30	16 75 21%

(2) Justification 7 – Highway 7 and Elm Street

Justification Table -2039 Total Traffic Volumes

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance		
		Free Flow**	Restr. Flow	Free Flow	Restr. Flow	Sectional		Entire %
						Numerical	%**	
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480 (720)	720	600	900	616	(86%)	
	B. Vehicle volume, along minor streets (average hour)	120 (180)	170	120	170	19	(11%)	
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	480 (720)	720	600	900	597	(83%)	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50 (75)	75	120	170	13	(17%)	

NOTE: AVH volumes used for analysis were estimated from the Peak Hour Volumes using the following relationships: $AHV = (am\ PHV + pm\ PHV)/4$

** under free flow and 1 lane, the AHV for Part 1A or 2A of Justification 7 must be met to $480 \times 1.50 = 720$ vph and $120 \times 1.50 = 180$ vph for Part 1B and $50 \times 1.50 = 75$ for Part 2B respectively.

2034 AM Peak Hour

		500	386	
0	0	470	30	13
		0	24	0
0	0	0	373	36
		0	0	0
		494	409	

100% Elm Street

2039 AM Peak Hour

		523	404	
0	0	491	32	14
		0	24	0
0	0	0	390	36
		0	0	0
		516	426	

Elm Street

PM Peak Hour

		564	729	
0	0	555	9	12
		0	25	0
0	0	0	717	97
		0	0	0
		580	814	

Elm Street

PM Peak Hour

		591	762	
0	0	581	9	13
		0	26	0
0	0	0	749	98
		0	0	0
		607	847	

Elm Street

- A. Vehicle volume, all approaches (average hour)
 B. Vehicle volume, along minor streets (average hour)
 A. Vehicle volume, major street (average hour)
 B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)

AM Peak	PM Peak	Criteria
1A 946	1A 1416	590 720 82%
1B 38	1B 37	19 180 10%
2A 908	2A 1378	572 720 79%
2B 24	2B 25	12 75 16%

AM Peak	PM Peak	Criteria
1A 987	1A 1476	616 720 86%
1B 39	1B 38	19 180 11%
2A 949	2A 1438	597 720 83%
2B 24	2B 26	13 75 17%