

Powell Grand

Preliminary Development Plan Application

05/20/2015

City of Powell, Ohio

Prepared For:

SCHOTTENSTEIN
REAL ESTATE GROUP

MARGELLO
DEVELOPMENT CO.

Prepared By:



CITY OF POWELL
PLANNING AND ZONING COMMISSION (P&Z)
PRELIMINARY DEVELOPMENT PLAN APPLICATION



ALL ITEMS ON THIS APPLICATION MUST BE COMPLETED.

Application Fee: \$400.00 + \$60.00 per acre

Applicant: Thomas L Hart, Esq., for Margello Development Co. & Schottenstein Real Estate Group LLC
Address/City/State/Zip: 117 Lazelle Road, Columbus, OH 43235 / Two Easton Oval, Ste. 510, Columbus, OH 43219
Email Address: margellodevelopment@gmail.com / bs@sregroup.com
Phone No: 614-848-4004/614-418-8900 **Cell Phone No:** 832-1667/406-3116 **Fax No:** 614-418-8920
Property Owner: Sawmill Seldom Seen LLC
Address/City/State/Zip: 4300 E Fifth Ave, Columbus OH 43219
Email Address: dirk.greene@spgroup.com
Phone No: 614-449-4298 **Cell Phone No:** _____ **Fax No:** _____
Architect/Designer for Applicant: Jim Houk/Rick Fay (site planing), OHM Advisors
Address/City/State/Zip: 580 N Fourth St, #630, Columbus, OH 43215
Email Address: Jim.Houk@ohm-advisors.com / rick.fay@ohm-advisors.com
Phone No: 614-418-0600 **Cell Phone No:** _____ **Fax No:** 614-418-0614
Property Address: 43.88 +/- acres at Sawmill Parkway and Seldom Seen Rd., Liberty Township
Lot Number/Subdivision: 3414-3417 **Existing Use:** PC/PI-Liberty Twp **Proposed Use:** PCD Powell
Reason for Administrative Review (attach necessary documents): _____

Checklist:

- ☐ Preliminary Plan requirements set forth in Section 1143.11(c).
- ☐ Provide any other information that may useful to the Planning and Zoning Commission or City Staff in the space below or attach additional pages.
- ☐ **15 copies** of all drawings, text, any other items, and application.
- ☐ Provide a PDF copy of all plans, drawings, text, any other items, and application on a CD.
- ☐ Attach the required fee - \$400.00 + \$60.00 per acre.

I agree to grant the City Staff, the Commission, Board or Council considering this application access to the property that is the subject of this application for the purposes of reviewing this application and posting public notice for this application.

Signature of Applicant: _____

Date: 5-26-2015

Office Use
Received

Office Use
AMT _____
TYPE/DATE _____
RECEIPT # _____
PAYOR _____
Payment

THE POWELL GRAND: RESORT LIVING IN AN ACTIVE ADULT, CLASS "A" GATED COMMUNITY

Preliminary Development Plan
May 26, 2015

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117 Lazelle Road
Columbus, Ohio 43235
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APPLICATION FOR PLANNED COMMERCIAL DISTRICT

DEVELOPMENT TEXT

(1) Name, address and phone number of applicant.

Margello Development Co.
Group
117 Lazelle Road
Columbus, Ohio 43235
614-848-4004
margellodevelopment@gmail.com

Schottenstein Real Estate

2 Easton Oval, Ste. 510
Columbus, Ohio 432119
614-418-8900
bs@sregroup.com

(2) Name, address, and phone number of registered surveyor, registered engineer and/or urban planner assisting in the preparation of the preliminary development plan.

Architect: Sullivan and Bruck

Planning Professionals:

James M. Houk, ASLA, AICP
VICE PRESIDENT, PLANNING, DESIGN, DEVELOPMENT
MANAGING DIRECTOR, OHIO

Rick Fay | RLA, LEED AP
LANDSCAPE ARCHITECT

OHM Advisors | ARCHITECTS. ENGINEERS. PLANNERS.
580 N. Fourth Street, #630
Columbus, Ohio 43215

614.418.0600
Jim.Houk@ohm-advisors.com
Rick.Fay@ohm-advisors.com

Civil Engineers:

Craig Bohning, EMH&T
Patricia Brown, EMH&T

Engineers, Surveyors, Planners, Scientists

5500 New Albany Road, Columbus, OH 43054

v. 614.775.4396 | f. 614.775.4804 | pbrown@emht.com; cbohning@emht.com

- (3) **A list containing the names and mailing addresses of all owners of property contiguous to, directly across the street from and within 250 feet of the property in question.**

See Exhibit A for adjacent property owners.

- (4) **Legal description of the property.**

See Exhibit B for legal description.

- (5) **A description of present use(s) on and off the land.**

The property is currently vacant and undeveloped with some agricultural use. The property is zoned in Liberty Township as Planned Commercial and Planned Industrial. These districts were established with a development plan named Seldom Seen Acres. The original development scheme included a mix of retail and commercial uses (including the possibility of a big box retailer) and Planned Industrial District uses, such as a self-storage facility. There is an existing lattice tower type of cellular tower at the southwest corner of the site.

- (6) **Draft of a proposed Ordinance, prepared with the advice and counsel of the Director Law, establishing this specific Development Plan as an additional effective zoning control over the land in question, consistent with the continuing authorities of the current Planned District zoning in these areas provided for elsewhere in this Zoning Ordinance.**

Will be submitted by City of Powell.

- (7) **A vicinity map at a scale approved by the Zoning Inspector showing all property lines, existing streets and alleys, approved future streets and land uses on adjacent Planned District areas, transportation and land use elements of the Municipality's adopted Comprehensive Plan, current zoning classifications and boundaries, and current land uses on the site of the proposed Planned District development and in the surrounding areas to the physical extent deemed necessary by the Zoning Inspector, but no less than 250 feet beyond the limits of the proposed Planned District Development Plan.**

See Exhibit C for Vicinity Map.

(8) **A preliminary development plan at a scale approved by the Zoning Administrator illustrating:**

See Exhibit E for Preliminary Development Plan.

A. The property line definition and dimensions of the perimeter of the site;

See Exhibit B for Boundary Survey.

B. Right-of-ways and paving widths of all existing, currently platted, and previously approved Planned District streets and alleys adjacent to, on, or abutting the site;

See Exhibit B for Boundary Survey, Exhibit D for Existing Conditions, and Exhibit E for Preliminary Development Plan.

C. The area of the site and its subareas in acres;

The site is 39.1+/- acres. There are five subareas, including:

- Subarea A – Four, 30 Unit, Three-Story Buildings, 5.237 acres.
- Subarea B – Fifteen, 4 Unit Ranch Buildings, 10.078 acres.
- Subarea C – Sixteen, 8 Unit, Two-Story Townhome Buildings, 14.181 acres.
- Subarea D-1 – 1.349 acres including open space and a dog park serving the residential subareas.
- Subarea D-2 - 2.069 acres including Mail/Utility facilities, Clubhouse, Patio/Fire Lounge, Pool, Putting Green and Community Garden serving the residential subareas.
- Subarea E, 6.106 – 2 Commercial lots of +/-2.3 and +/-2.7 acres respectively, and a proposed dedicated right-of-way +/- 1.2 acres.

D. The topography of the site and abutting areas at no more than five (5) foot contour intervals;

See Exhibit D for Existing Conditions, and Exhibit F for Grading Plan.

E. Existing surface drainage ways and surface sheet flow patterns;

See Exhibit D for Existing Conditions, Exhibit F for Grading Plan, and Exhibit H for Utility Feasibility.

F. Flood plain areas, ravine-bottom areas, and areas of ground slope in excess of six (6) percent;

None on site.

G. Existing vegetation on the site with the specific tree spots for all trees six (6) inches in diameter or greater, measured twenty-four (24) inches from the ground;

See Exhibits G and J for landscaping and tree preservation plans.

H. Existing easements on the site with notations as to their type, extent, and nature;

See Exhibit B for Survey, Exhibit D for Existing Conditions, Exhibit E for Preliminary Development Plan, and Exhibit H for Utility Feasibility.

I. The location and dimensions of existing utilities on and adjacent to the site, including the nearest sanitary sewer, with manhole invert elevations;

See Exhibit H for Utility Feasibility.

J. Calculation of the maximum residential units permitted on the site under the terms of the Zoning Ordinance, including delineation of the sub districts of the site upon which these calculations have been made;

Subareas are delineated as follows:

- Subarea A: 5.237 acres
 - Units provided: 120 units
- Subarea B: 10.078 acres
 - Units provided: 60 units
- Subarea C: 14.181 acres
 - Units provided: 128 units
- Subarea D-1: 1.349 acres
 - Units provided: 0 units
- Subarea D-2: 2.069 acres
 - Units provided: 0 units.
- Subarea E: 6.106 acres
 - Units provided: 0 units

Under 1143.09 (c)(5) A – As this site has immediate access to Sawmill Parkway via Sawmill Drive, the maximum number of allowable multi-family units is equal to the acreage in the planned district tract times two and one-half. (39.1 acres x 2.5 = 97.5 units) A divergence is therefore necessary under this section of the code to allow the proposed unit count and is so requested.

Under 1143.09 (c)(5) B – The maximum number of multi-family dwelling units on any single acre shall not exceed twelve (12) units to the acre. This provision is requested for divergence for residential subareas A, in which in some cases this maximum is exceeded.

Under 1143.09 (c)(10) A – As new residential units are planned as part of a PC district, the residential subareas in this PC district shall be designated Planned Residential and shall meet all requirements for density and physical arrangements except where divergences are requested.

Section 1143.09 (c) (4) A

- Open space required (20% of 32.99 ac.): 6.6 ac.
- Open space provided: 10.6 ac. (32%)
- Open space shall be protected by deed restriction, and shall be owned and maintained by the developer . See exhibits E and M.

Section 1143.09 (c) (4) B

- A divergence is requested to reduce the required 5 acre, relatively flat grasses common area to 1.35 acres to be provided in Subarea D-1, and to permit the uses of Subareas D-1 and D-2 to serve as the recreational elements indicated in the zoning code.
 - The targeted empty nester audience of this site does not require the intensive active recreational space specified in the code section.
 - The site provides overall open space above the required minimum 20%.
 - Subareas D-1 and D-2 offer recreational uses in the form of a dog park, common lawn open spaces for passive recreation, pool and patios, putting green, and community garden. Additionally, Subarea C includes a gazebo that overlooks the pond, offering passive recreation opportunities.

- This site is located across Seldom Seen Road and the future city park.

Section 1143.09 (c) (4) D

- This property has been used for agriculture historically, therefore, no natural watercourses traverse the site within the property boundaries. The headwater for Bartholomew Run is located at the southeast corner of the project and will be the discharge point for the site. A storm water basin will be located near this location to provide erosion and sediment control during construction and storm water quantity and quality control post-construction. The two man-made watercourses crossing the site will be filled and piped as part of the development process.
- Slopes of 6% or more are associated with the watercourses reference above, drainage ditches, or by stockpiles related to prior construction activities on the site, and the existing screen mound along the south property line.

Section 1143.13

Under 1143.13 PR-Planned Residence District – Under gross density limits for other than single-family or two family housing, the site does not exceed the gross density limit specified of “not to exceed 9 dwelling units per gross acre.” The site comes in at 8.12 gross density when density is calculated as to the entire developed property. There are a total of 308 dwelling units on the residential portion of the property, which totals 32.9 acres. This creates a net density of 9.36 units per acre on the residential portion. A divergence is requested above the 9 units per acre for a Planned Residential District. This is most justifiable because senior, active adult and empty nester residents have significantly less traffic impact based on travel patterns, very little impact on schools and use less utilities and services compared to other resident populations.

Total building footprint coverage is 21.8% of developable area (building footprints only) which requires a divergence above the 20% code maximum. Such a divergence is requested.

Total impervious surface coverage is 47.09% of the 33 acre residential site. (Code is 70% total lot coverage of all impervious surfaces.)

Divergences are requested from 1143.13(a) MAXIMUM BUILDING HEIGHT for the height of principal buildings and the two stories limit.

The height for the four 30 unit, three story buildings are an average height of 40 feet, 5 1/16 inches. This is approximately 5 feet, 5 inches greater than the code standard of 35 feet in height for residential districts and typical housing. Roof peak heights for the 30 unit buildings range up to 50 feet, 4 1/8 inches in some instances to allow for architectural elements. Such roof peaks, variations in roof heights and other architectural features including dormers, provide an attractive residential style building that refines and softens the current viewshed from the west, which is currently dominated by the existing fitness building and its significant height and commercial/industrial design. The average and peak building heights are further moderated by the building height at the roof truss bearing height,(gutter height), which is 30 feet, 6 inches, which is significantly lower than many homes and other three story buildings.

A divergence is requested for the NOTE provision of the 1143.13 providing no more than 4 dwelling units attached side-by-side for subarea A and C, and a total of no more than 8 units in any one structure for subarea A.

K. A preliminary plan for the first, or next, phase of site development illustrating;

1. New street centerlines, right-of-ways, and street classification types;

See Exhibit E for Preliminary Development Plan.

2. Names of existing and proposed streets;

See Exhibit D for Existing Conditions. All streets and access drives utilized shall be private.

3. Generalized lot and block layouts, indicating and illustrating property lines, minimum lot areas, minimum building setbacks and yards, location and extent of major off-street parking areas, etc.;

See Exhibit E for Preliminary Development Plan.

4. Subareas of the site to be developed, by land use type, housing types, and housing densities, including subarea statistics;

- Subarea A
 - 5.237 acres

- Four, 30 Unit, Three-Story Buildings; 120 units
 - Net density: 22.9 du/ac.
- Subarea B ,
 - 10.078 acres.
 - Fifteen, 4 Unit Ranch Buildings; 60 units
 - Net density: 6.0 du/ ac
- Subarea C
 - 14.181 acres.
 - Sixteen, 8 Unit, Two-Story Townhome Buildings; 128 units
 - Net density: 9.0 du/ac.
- Subarea D-1
 - 1.349 acres
 - 0 units
 - Net density: 0.0 du/ac
- Subarea D-2
 - 2.069 acres
 - 0 units
 - Net density: 0 du/ac
- Subarea E
 - 6.106 acres
 - 0 units
 - Net density: 0 du/ac

5. All proposed structures shall be located showing square footage, tenant or user types, and expected entranceways and service or loading areas;

See Exhibit E for Preliminary Development Plan and Exhibit I for Architectural details.

6. Common open areas, public lands, and natural scenic easements, including the area of each;

See Exhibit E for Preliminary Development Plan, and Exhibits L for Connection to City Park, and M for Proposed easements, deed restrictions, and protective covenants.

7. Proposed landscape treatment of the site;

See Landscape Plan attached as Exhibit G.

8. Proposed utility patterns and provisions including sanitary sewer, individual waste disposal systems, storm sewer, trash collection systems, outdoor lighting, and water supply,

including relevant easements and engineering feasibility studies or other evidences of reasonableness;

See Utility Service Letters and Utility Plan attached as Exhibit H. In addition, the applicant shall work with the City Engineering Department on site details and as part of final engineering plan review.

9. Provisions for accommodating surface drainage runoff;

See Exhibits E and Exhibit F for approximate location of storm water detention basins, and Exhibit M, draft easement agreements.

10. Proposed architectural design criteria;

See Exhibit I for architectural elevations.

11. Proposed pedestrian/jogging/bicycle pathways and equestrian paths, including locations, dimensions, landscape and construction, including relationships of such pathways to existing and proposed future pathways on surrounding property;

See exhibits E, H, and L for such pathways and connections to the future City Park. These proposals are subject to and shall be approved by the City Engineer as part of final engineering plan review.

12. Overall site development statistics comparing this plan for development with requirements of this Zoning Ordinance and with the comprehensive plan and indicating that all requirements of this Zoning Ordinance and the comprehensive plan have been met in this preliminary plan and will be met in final development.

The plan incorporates the direction given to the applicant by the planning and zoning director, as well as comments and suggestions by the Planning and Zoning Commission.

The upscale active adult, senior and empty nester housing proposed for the site is consistent with many comments expressed during the ongoing Community Plan update, based on the recognition that Powell has many upscale single-family homes but few upscale dwellings meeting the changing needs of active adults, empty nesters, and seniors. The size and scale of the building and the different housing options match the development intensity of the

Sawmill Parkway corridor and the changing expectations and needs of the community. This site is no longer appropriate for single-family development based on neighboring development. Lower intensity of use in terms of people per units, very limited school use, less traffic impact, low utility use and the opportunity for housing that allows seniors and empty nesters to remain in the community are all positives of this plan. The upscale nature of the architecture and luxury of the amenities matches the quality of the Powell environment.

The Powell Zoning Code allows for multi-family residential, elderly households, senior housing facilities and congregate housing within the PC – Planned Commercial District. The maximum number of dwelling units in any Planned District development plan cannot exceed twelve (12) units per any one acre and no more than 4 dwelling units can be attached side-by-side, with no more than 8 per structure. Divergences are requested for both these provisions. The Planned Residential District allows for up to 9 du/acre and the proposed development has a net density of 9.36 du/acre.

Consideration is requested for greater density based on the less intense use of the land, traffic, schools, utilities, etc. from active adults, empty nesters and seniors, as well as the fact that some units are likely to be unoccupied in winter months due to travel and second dwelling arrangements for several residents.

Yard Setbacks

- Building and Parking setback from the railroad right-of-way shall be 40 feet.
- Building and parking setback from the south property line shall be 40 feet.
- Building setback from the west property line shared with the commercial outparcel shall be 25 feet.
- Parking setback from the wet property line shared with the commercial outparcel shall be 15 feet.
- Minimum distance between buildings shall be 30 feet.

Building Setbacks

- Front building setback from any right-of-way shall be 60 feet.
- Front parking setback from any right-of-way shall be 15 feet.

Parking and Circulation

- Subarea A shall provide parking at a minimum of 2.5 spaces per dwelling unit.

- Subarea B shall provide parking at a minimum of 3 spaces per dwelling unit.
- Subarea C shall provide parking at a minimum of 3 spaces per dwelling unit.
- Parking spaces shall be a minimum 9 feet x 18 feet.
- Parking may be provided in the form of garage spaces, tandem spaces in garage driveways, surface parking spaces.
- A +/- 1.2 acre portion of Subarea E shall be a publicly dedicated 60' wide right-of-way to extend Bunker Lane to connect to Sawmill Parkway. The road and utilities shall be dedicated to the city for ownership and maintenance. .
- Private streets and drive aisles shall be a minimum of 22 feet wide.
- An 8 feet wide asphalt bike path shall be provided as shown on the Preliminary Development plan. The bike path shall be built within the Sawmill Parkway, Bunker Lane, and Seldom Seen rights-of-way. The path will be built by the developer, and owned and maintained by the city.
- Off-site roadway improvements are to be determined based on the outcome of final engineering and in coordination with the City and County Engineering staff.
- A pedestrian connection is to be built between this site and the city park on the north side of Seldom Seen Road.

Lot Coverage – Building

- Maximum lot coverage by buildings for combined subareas A, B, C, D-1, and D-2 shall be 21.8%. This requires a divergence from code required maximum of 20% lot coverage.
- See Exhibit E Preliminary Development Plan.

Lot Coverage – Total

The code allows 70% total lot coverage (all impervious surfaces). The development plan depicts 47.09% total lot coverage of building, sidewalks and vehicle use area with the residential subareas.

Landscaping

- Landscaping shall be provided per code requirements.
- Along the east property line adjacent to the rail road, a 3-6 feet tall mound with buffer planting shall be provided.

- Subarea E, excluding the proposed dedicated right-of-way, shall provide a screen as specified by city code along any boundary shared with Subarea B and C.
- Along the south property line, an existing +/- 6 feet tall mound with evergreen trees spaced at +/- 1- feet to 15 feet on center shall be preserved. Existing evergreen trees installed as part of that buffer that are dead or dying shall be replaced. The evergreen tree planting shall be extended along the portion of the south property line adjacent to existing buildings, as shown on the landscape plan, except where restricted by utility installations. Existing trees south of the mound shall remain.

Fencing and Wall Enclosures

- At the site entrances to Subareas A, B, and D-2, decorative entry columns/walls/fences and/or gates shall be permitted, but not required, and shall be permitted a 0' setback from the Bunker Lane right-of-way.
 - Such features shall include ornamental landscaping in the effect of an entry feature.
 - Gates may be operable or not operable.
 - Access through operable gates shall meet the approval of the fire department.
 - Columns, walls, and/ or fences included in the design shall not exceed six feet in height.
 - Vehicle sight distance shall meet the approval of the city staff
 - Designs shall be provided with Final Development Plan.

Signage

- Subarea A shall be permitted one monument sign at the corner of Seldom Seen Road and Bunker Lane. Signage shall be permitted to meet code requirements for “non-residential” signage.
- Subarea E-1:
 - Signage shall be per non-residential code requirements.
 - A monument sign shall be permitted along Sawmill Drive frontage and a joint identification sign, with agreement of the property owners, to be shared by the tenant/ owner of Subarea E-1 and the tenant/ owner of the multifamily subareas.
- Subarea E-2:
 - Signage shall be per code requirements.

- A monument sign shall be permitted along Sawmill Parkway frontage and to be a joint identification sign, with agreement of the property owners, to be shared by the tenant/ owner of Subarea E-1 and the tenant/ owner of the multifamily subareas.
- This section shall not exclude from any subarea additional signage as normally permitted by city code.

Lighting

- Subareas A, B, C, and D-2 shall provide site lighting within vehicular use areas and common pedestrian spaces.
- Light fixtures shall not exceed 14 feet in height.
- Light fixtures shall be cut-off style.
- See exhibit K for lighting information.

Building Height

The height for the four 30 unit, three story buildings are an average height of 40 feet, 5 1/16 inches. This is approximately 5 feet, 5 inches greater than the code standard of 35 feet in height for residential districts and typical housing. Roof peak heights for the 30 unit buildings range up to 50 feet, 4 1/8 inches in some instances to allow for architectural elements. Such roof peaks, variations in roof heights and other architectural features including dormers, provide an attractive residential style building that refines and softens the current viewshed from the west, which is currently dominated by the existing fitness building and its significant height and commercial/industrial design. The average and peak building heights are further moderated by the building height at the roof truss bearing height,(gutter height), which is 30 feet, 6 inches, which is significantly lower than many homes and other three story buildings.

Minimum Unit Area

- One bedroom: 810 sq.ft.
- Two bedrooms: Four different two bedroom designs, ranging from 1,200 sq. ft. to 1,350 sq.ft.
- Three bedrooms: Several designs ranging from 1,585 sq. ft. to 1,800 sq.ft.

L. Projected development schedule by subareas of the entire planned development site, and for the first, or next phase of development, including land uses, public areas, natural and scenic reserves, streets, building, utilities, and other facilities, indicating the relationship of the proposed development to existing and probable uses of surrounding areas during the development timetable.

The multifamily site will not be phased and construction completion will be anywhere from 18-24 months.

The commercial subareas E-1 and E-2 shall be permitted to be constructed as independent phases.

M. An overall traffic scheme, illustrating points of access, parking areas, including the number of parking spaces and indicating visitor, employee and service traffic flow, illustrating calculated peak hour traffic use for residents and employees as well as deliveries and other transport and the effect of this traffic on the community traffic ways.

- See Exhibit E for traffic circulation and parking for this site.
- Subarea A shall be permitted minimum parking of 2.5 spaces per unit.
- Minimum parking for Subareas B, C, D-1, and D-2 shall be 3 spaces per dwelling unit.
- Parking for Subareas A, B, C, D-1, and D-2 shall be permitted to be located within any multifamily subarea.
- Parking is required at 3 spaces for each unit or 924 spaces and approximately 1,031 spaces are provided.

- N. **If to be developed in phases, the entire site development shall be described in outline and diagrammatic plan form, and in a complementing detailed text in a manner calculated to assure City officials that Planned Development requirements and other requirements of this Zoning Ordinance shall be met in the detailed development of the phases to follow, and that the entire Planned Development area will meet all of the requirements of this Zoning Ordinance, such diagrams and descriptive texts being accepted with, and becoming a part of the extended zoning plan for the entire site.**

Subareas shall be developed as described within this text and accompanying preliminary development plans. Any item not specified within these documents shall be governed by City of Powell Code of Ordinances.

- (9) **Evidences of the ability of the applicant to carry forth its plan by control of the land and the engineering feasibility of the plan, and that the applicant has sufficient control over the land and financing to initiate the proposed development plan phase within two (2) years.**

The Applicant is in contract to purchase the property. The Applicant builder, Schottenstein Real Estate Group (SREG), is a builder, developer and operator of active adult, empty nester and senior housing in several states, including Florida, North Carolina and Ohio. SREG has three plus decades of experience in the residential housing market and development, and is a successful multi-state developer of similar luxury rental and fee simple projects. The Applicant developer, Margello Development Company has significant development and successful project experience in the Powell community, including retail, office and senior villages.

- (10) **Evidence of the applicant's ability to post a bond if the plan is approved assuring completion of public service facilities to be constructed within the project area by the developer.**

The Applicants shall provide evidence that they have the ability to post a bond for the City of Powell Council prior to Final Development Plan approval.

- (11) **Verification by the owner of the property that all the information in the application is true and correct to the best of his knowledge.**

The landowner and applicant have reviewed the included information in the Combined Preliminary Development and Final Development Plan submittal and believe it to be true and correct to the best of their knowledge.

- (12) **A statement of the character and nature of the development including the cost range or rent levels for housing in residential development and the general types of business or industrial and commercial developments.**

The "Powell Grand – Resort Living" is an active adult, Class A, gated community proposed as a Planned Commercial District zoning under Powell's Zoning Ordinance. The community will provide a comparable option in terms of aesthetics, amenities and architectural quality for many Powell residents wishing to downsize their current high-quality single-family home to a more active adult and/or senior living environment within Powell. Powell Grand will help facilitate "aging in place" for those Powell residents wishing to change housing options, without leaving the community that has been their home. There will be other residents, new to Powell, who will be attracted to this unique, incomparable central Ohio community.

The total site is made up of 39.1 +/- acres. **A proposed internal public road (+/- 1.2 acres) will connect from Sawmill Parkway** to the intersection of Sawmill Drive and Bunker Lane. The residential component includes 308 units of leased dwellings with three distinct building types and housing options, a clubhouse and related open spaces and site amenities on +/- 32.9 acres. Five acres of commercial property are planned on two lots near or adjacent to Sawmill Parkway.

Rents/Lease Rates for eight different dwelling units will range from the \$900's-\$1900's per month.

Amenities included with this plan are a bike path connection along Sawmill Parkway and the interior public streets leading to a pathway tunnel under Seldom Seen Road to the new Seldom Seen Park. A large club house in the east-central portion of the site, including a pool, fitness center, community gathering rooms, fire pit lounge area, community garden and golf putting green are available for use by the Powell Grand residents. The site will also include a gazebo overlooking the pond, and an enclosed dog-park. There will be a site office open 7 days a week, 24-hour emergency services, and onsite staffing to provide special, outstanding services for residents.

- (13) **A statement of the general impact the development will have on the infrastructure, municipality and schools including projected demographics, a traffic impact study and a fiscal impact analysis may be required by the Planning and Zoning Commission.**

The proposed development has low impacts on traffic, utility usage and infrastructure in general terms, as compared to typical single-family homes and

most commercial zonings in the area. The travel and commuting patterns by active adults, empty nesters, and seniors are demonstrably lower than other commuters. Traffic study analysis is attached to application as Exhibit P. Approximately five to seven staff members (3 to 4 leasing and 2 to 3 maintenance) will work at the site during day time hours, with lesser staff levels at night. The proposed land use compares favorably to the current Township zonings that could create peak commuting and overall traffic in much higher volume and likely more average daily trips.

There is not expected to be a real impact on schools in terms of new students, but positive tax benefits are expected with the commercial property development and very few children to educate.

(14) **A fee as established by ordinance.**

The fee payment is included with this application.

In accordance with the requirements of the codified ordinance 1431.11(g), in approving a preliminary development plan, the Planning and Zoning Commission shall consider:

a) **If the proposed development is consistent with the intent and requirements of this Zoning Ordinance;**

The site will be zoned as Planned Commercial District (PC) upon its annexation into the city. The PC allows for residential uses, elderly households, elderly housing facilities, and such uses as congregate housing. As a planned district, the Planning and Zoning Commission can create specific regulations, approve uses and grant divergences to the code requirements provided they are in line with the scale and size of the community and are desirable land uses.

Summary of Divergences Requested:

1. **Building Area Coverage** The proposed building footprint area is approximately 21.8% (312,681.8 square feet) of the total land area and therefore a 1.8% divergence for lot coverage is requested with this planned district approval.

2. **Under 1143.09 (c)(5) A – As this site has immediate access to Sawmill Parkway via Sawmill Drive, the maximum number of allowable multi-family units is equal to the acreage in the planned district tract times two and one-half. (39.1 acres x 2.5 = 97.5 units) A divergence is, therefore, necessary under this section of the code to allow the proposed unit count of 308 and is so requested.**

3. Under 1143.09 (c)(5) B – The maximum number of multi-family dwelling units on any single acre shall not exceed twelve (12) units to the acre.

This provision is requested for divergence for residential subareas A, B and C, in which in some cases this maximum is exceeded.

4. Under 1143.09 (c)(10) A – As new residential units are planned as part of a PC district, the residential subareas in this PC district shall be designated Planned Residential and shall meet all requirements for density and physical arrangements.

Section 1143.09, (c), (4), B

- A divergence is requested to reduce the required 5 acre, relatively flat grasses common area to 1.35 acres to be provided in Subarea D-1, and to permit the uses of Subareas D-1 and D-2 to serve as the recreational elements indicated in the zoning code.
 - The targeted empty nester audience of this site does not require the intensive active recreational space specified in the code section.
 - The site provides overall open space above the required minimum 20%.
 - Subareas D-1 and D-2 offer recreational uses in the form of a dog park, common lawn open spaces for passive recreation, pool and patios, putting green, and community garden. Additionally, Subarea C included a gazebo that overlooks the pond offering passive recreation opportunities.
 - This site is located across Seldom Seen Road from the future city park.

5. Under 1143.13 PR-Planned Residence District – under gross density limits for other than single-family or two family housing, the site does not exceed the gross density limit specified of “not to exceed 9 dwelling units per gross acre” as the site comes in at 8.12 gross density when the entire property is used to calculate density. There are a total of 308 dwelling units on the residential portion of the property, which totals 32.9 acres. This creates a net density of 9.36 units per acre on the residential portion. Consideration is requested for a divergence above the 9 units per acre for a Planned Residential District because senior, active adult and empty nester residents have significantly less traffic impact based on travel patterns, very little impact on schools and use less utilities and services compared to other resident populations.

6. A divergence is requested for the NOTE provision of the 1143.13 providing no more than 4 dwelling units attached side-by-side for subareas A and C, and a total of no more than 8 units in any one structure for subarea A.

7. 1145.34 Fences, walls, shrubbery, and hedges in “residence” (r), “old powell residence” (opr), and “planned residence” (pr) districts, as well as in all residential portions of other planned districts:

A divergence is requested to permit the entry gates/ fences/ columns/ walls in front yard with a 0’ setback.

8. 1151: Signage

- Divergence to permit 3 multifamily signs, 2 on commercial property
- Divergence to permit shared signs with commercial outparcels.

9. Height divergence – Divergences are requested from 1143.13(a) MAXIMUM BUILDING HEIGHT for the height of principal buildings and the two stories limit. The height for the four 30 unit, three story buildings are an average height of 40 feet, 5 1/16 inches. This is approximately 5 feet, 5 inches greater than the code standard of 35 feet in height for residential districts and typical housing. Roof peak heights for the 30 unit buildings range up to 50 feet, 4 1/8 inches in some instances to allow for architectural elements. Such roof peaks, variations in roof heights and other architectural features including dormers, provide an attractive residential style building that refines and softens the current viewshed from the west, which is currently dominated by the existing fitness building and its significant height and commercial/industrial design. The average and peak building heights are further moderated by the building height at the roof truss bearing height,(gutter height), which is 30 feet, 6 inches, which is significantly lower than many homes and other three story buildings.

b) **The relationships between uses, and between uses and public facilities, streets, and pathways;**

The proposed land uses, type, location and intensity are appropriate for the site and its surrounding area. The land uses proposed are similar in scale, size and use to the commercial and residential uses in proximity. The residential building designs fit the scale of the area and Powell's market expectations.

The plan provides a transition of uses and density by matching unit types with the existing Woods at Big Bear Farms condominiums on south border, and by transitioning to higher density to the north. The commercial lots fronting Sawmill Parkway and Sawmill Drive are consistent with existing commercial uses. The two and three story buildings are placed closest to the existing three story Urban Active facility bordering the northeast corner of the site, matching height and massing. The railroad tracks separate the site from all uses to the west.

A proposed tunnel pathway from the site to the future city park site connects with a bikepath system that ties the property into future bike pathways along Sawmill Parkway on the southern property border and to the east and west along Seldom Seen Road.

c) **Adequacy of provisions for traffic and circulation, and the geometry and characteristics of street and pathway systems;**

The proposal has adequate provisions for traffic and on-site circulation. Sawmill Parkway and Seldom Seen Road are capable of handling increased traffic as a result of the development. The interior circulation has been designed to allow for the flow of traffic throughout the entire site. There is also adequate parking on-site.

See Traffic Analysis, Exhibit P for details.

d) **Adequacy of yard-spaces and uses at the periphery of the development;**

Yard and open spaces are adequate for this type of multi-family living. Common areas make up most of the useable spaces with periphery spaces designed mainly to buffer the community from other uses and the railroad tracks.

e) **Adequacy of open spaces and natural preserves and their relationship to land use areas and public access ways;**

Green spaces on the site are more than adequate to meet code requirements. There is significantly more (32% and 10.5 acres) than the required 20% green

space and recreational areas, much of it programmed for specific uses and/or amenitized to fit the needs of residents.

f) The order, or phases, in which the development will occur and the land uses and quantities to be developed at each phase;

This development will likely be built in 2-3 phase(s), depending on market conditions and absorption, which is appropriate for the size and scale of this proposal. The multifamily sites will be built as one phase. The commercial site may be built as two separate phases.

g) Estimates of the time required to complete the development and its various phases;

This proposal can be developed within an appropriate time frame projected at a range of 18 to 24 months, but subject to economic and market conditions.

h) Improvements to be made by the Municipality, if any, and their cost;

The applicant is in discussions with the City regarding this item.

i) The community cost of providing public services to the development, and

This development will not add a considerable amount to the overall cost of public services provided to it.

j) Impacts of the development on surrounding or adjacent areas.

There will be minimal impacts upon the surrounding/adjacent areas near the site or the overall city. The site will generate enough taxes to cover any potential additional city expenses.

Section 1143.11(k) Recommendation by the Planning and Zoning Commission

THE FOLLOWING SHALL BE CONSIDERED IN APPROVING THE FINAL DEVELOPMENT PLAN:

(1) Can the development plan or its phase be initiated within two years and completed within five years?

Yes.

(2) Have the requirements of the Comprehensive Plan relative to the site been fulfilled?

Yes. This proposal fits with ongoing comments/requests documented during the current Powell Comprehensive Plan update process, where people site the need for higher-end senior and active adult housing. This plan meets that need because it provides Powell's long term residents new housing options to "age in place" in a luxury living environment that is consistent with the quality and amenity level of existing Powell residences. Residents can downsize while staying in their own community.

The ability to provide high quality housing for seniors, allowing independent, active and attractive living arrangements, is also a benefit to many existing single-family residents, whose older loved ones choose to live close to their families in a flexible lease situation. This allows for care-free travel and/or splitting time between other residences, while giving families the opportunity to strengthen generational and community ties.

Such an active adult and empty nester housing with access to Sawmill Parkway, and proximity to health-care services, commercial, other multi-family districts and retail uses also represents appropriate planning. Utility and peak traffic impacts are limited, with virtually zero school impact. However, the community benefits with receipt of additional real property taxes.

(3) Are the proposed streets suitable and adequate to carry anticipated traffic, and will increased densities generate traffic in such amounts to overload the street network outside the development plan area?

The proposed development has lower impacts on traffic, utility usage and infrastructure than the zoning approved previously in the Township. Sawmill Parkway and Seldom Seen Road traffic improvements are adequate to handle the increase in traffic, much of which will be generated off-peak. (See Traffic Analysis, Exhibit P in this regard) This is an example of a development that is sized based the existing infrastructure that is in place to handle it.

(4) Can the non-residential development be justified at the location and in the amounts proposed?

Yes. Commercial development is appropriately placed and is in keeping with the area.

(5) Are the housing densities warranted by the amenities and conditions incorporated in the development plan and in accordance with the planned district development requirements?

Yes, see the answer to number 2 above in this section and divergence explanation related to density. In addition, the development is highly amenitized and architecture is consistent with Powell's high quality design environment.

(6) Are the lands to be dedicated to public use of acceptable and usable size, shape, and location?

Upon approval, the City will cooperate with Developer to cause the Property to be replatted from the currently effective plat to permit the development of the Property generally in accordance with the Development Plan Concept. In connection therewith, the City will cooperate in vacating the existing public road designated "Revere Court" as well as the platted setbacks along Seldom Seen Road, it being the intention of the parties that setbacks will be conformed/addressed based on the outcome of this rezoning.

(7) Can the area surrounding the proposed development be planned and zoned in coordination with and in substantial compatibility with the proposed development?

Yes. The surrounding area is mostly commercial, retail, park or similar multi-family. Assisted living and health care services are also close to the vicinity and are consistent with this use.

(8) Are the existing and proposed utility services adequate for the population densities and uses proposed?

Yes

(9) Has adequate provision been made for the detention, retention, and channelization of surface drainage runoff?

Yes. See the attached plans and Exhibit M for storm water facilities and maintenance.

EXHIBIT
ADJACENT PARCEL OWNERS

Subject Parcels to be Annexed:

1. #31942302002000
 9121 Sawmill Parkway
 Powell, OH 43065
 Sawmill Seldom Seen LLC
 4300 East Fifth Avenue
 Columbus, OH 43219
2. #31942302001000
 8957 Bunker Lane
 Powell, OH 43065
 Sawmill Seldom Seen LLC
 4300 East Fifth Avenue
 Columbus, OH 43219
3. #31942302001002
 3280 Revere Court
 Powell, OH 43065
 Sawmill Seldom Seen LLC
 4300 East Fifth Avenue
 Columbus, OH 43219
4. #31942302001003
 8882 Revere Court
 Powell, OH 43065
 Sawmill Seldom Seen LLC
 4300 East Fifth Avenue
 Columbus, OH 43219

Adjacent Parcels:

1. #31942202051000
 Seldom Seen Road
 Powell, OH 43065
 City of Powell
 47 Hall St
 Powell, OH 43065

2. #31931401023000
3474 Sawmill Drive
Powell, OH 43065
Realty Income Properties 24 LLC
3474 Sawmill Drive
Powell, OH 43065
3. #31931401022001
2.996 Acres, Lot 3413 Seldom Seen Acres
Sawmill Parkway
Powell, OH 43065
SSA Ltd.
Sawmill Parkway
Powell, OH 43065
4. #31931401023001
1.859 Acres, Lots 4497 Seldom Seen Acres
Realty Income Properties 24 LLC
Sawmill Road
Powell, OH 43065
5. #31942305003000
425 Village Park Drive
Powell, OH 43065
Fernco Development Ltd.
425 Village Park Drive
Powell, OH 43065
6. #31942305002000
489 Village Park Drive
Powell, OH 43065
LDH 2000 Family Limited Partnership
c/o Countryside Construction
P. O. Box 389
Delaware, OH 43015
7. #31942601002001
321 Bear Woods Drive
Powell, OH 43065
Village of Powell
47 Hall Street
Powell, OH 43065

8. #31942601002537
340 Park Woods Lane
Powell, OH 43065
Paul A. Bischoff
340 Park Woods Lane
Powell, OH 43065
9. #31942601002554
335 Bear Woods Drive
Powell, OH 43065
Continuing Partners Limited Partnership
335 Bear Woods Drive
Powell, OH 43065
10. #31942601002527
393 Park Woods Lane
Powell, OH 43065
Julia Baranova Benet
393 Park Woods Lane
Powell, OH 43065

ALTA/ACSM LAND TITLE SURVEY

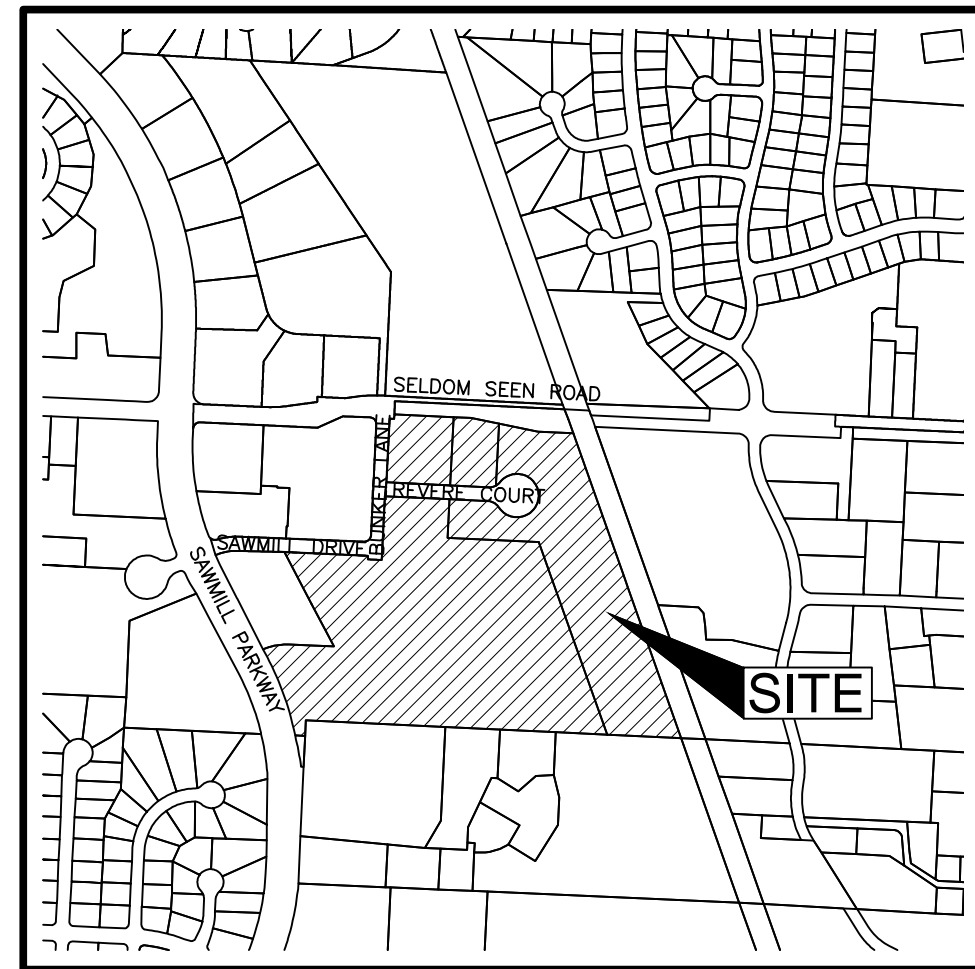
FARM LOT 10, QUARTER TOWNSHIP 3, TOWNSHIP 3, RANGE 19

FARM LOTS 35 AND 36 QUARTER TOWNSHIP 4, TOWNSHIP 3, RANGE 19

UNITED STATES MILITARY LANDS

LIBERTY TOWNSHIP, DELAWARE COUNTY, OHIO

LEGEND	
	= Telephone Pedestal Box
	= Telephone Pole
	= Gas Marker Post
	= Transformer
	= Sanitary Sewer Manhole
	= Storm Sewer Catch Basin
	= Storm Sewer Curb & Gutter Inlet
	= Storm Sewer Manhole
	= Guy Wire & Anchor
	= Utility Pole w/ Multiple Services
	= Centerline of Fire Hydrant on Top
	= Water Valve
	= Overhead Utilities



LOCATION MAP AND BACKGROUND DRAWING

NOT TO SCALE

DESCRIPTION
Situating in the Township of Liberty, County of Delaware and the State of Ohio and bounded and described as follows:

PARCEL 1:

Being known as Lot Number Three Thousand Four Hundred Fourteen (3414) in SELDOM SEEN ACRES, as the same is numbered and delineated upon the recorded plat thereof, of record in Plat Cabinet 2, Slides 245, 245A-245B, Delaware County Recorder's Office.

PARCEL 2:

Being known as Lot Number Three Thousand Four Hundred Fifteen (3415) in SELDOM SEEN ACRES, as the same is numbered and delineated upon the recorded plat thereof, of record in Plat Cabinet 2, Slides 245, 245A-245B, Delaware County Recorder's Office.

PARCEL 3:

Being known as Lot Number Three Thousand Four Hundred Sixteen (3416) in SELDOM SEEN ACRES, as the same is numbered and delineated upon the recorded plat thereof, of record in Plat Cabinet 2, Slides 245, 245A-245B, Delaware County Recorder's Office.

PARCEL 4:

Being known as Lot Number Three Thousand Four Hundred Seventeen (3417) in SELDOM SEEN ACRES, as the same is numbered and delineated upon the recorded plat thereof, of record in Plat Cabinet 2, Slides 245, 245A-245B, Delaware County Recorder's Office.

Schedule B Part II Items from Title Commitment Number 30625 issued by First American Title Insurance Company with an effective date of December 22, 2014 at 7:00 A.M.

Items 1-18 NOT SURVEY RELATED ITEMS.

Item 19 Easements appearing of record in Official Record Volume 79, page 2547 and Official Record Volume 523, page 77, Recorder's Office, Delaware County, Ohio. 10' ELECTRIC EASEMENT OF V. 79, PG. 2547 IS LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON. 10' ELECTRIC EASEMENT OF V. 523, PG. 77, IS LOCATED ON THE SUBJECT TRACT CENTERED ON LINES AS INSTALLED NOT PLOTTED.

Item 20 Easements appearing of record in Official Record Volume 668, page 2503, Recorder's Office, Delaware County, Ohio. 10' GAS EASEMENT OF V. 668, PG. 2503, IS LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON, THE 30' TEMPORARY CONSTRUCTION EASEMENT HAS EXPIRED.

Item 21 Easement appearing of record in Official Record Volume 645, page 296, Recorder's Office, Delaware County, Ohio. 20' SANITARY EASEMENT OF V. 645, PG. 296, IS LOCATED ON THE SUBJECT TRACT SHOWN HEREON.

Item 22 Cell Tower Lease appearing of record in Official Record Volume 46, page 598, Assignment of record in Volume 54, page 807 and Volume 656, page 771, Recorder's Office, Delaware County, Ohio. IS LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON.

Item 23 Easement Agreement appearing of record in Official Record Volume 20, page 726, Assignment of record in Volume 54, page 807 and Volume 656, page 771, Recorder's Office, Delaware County, Ohio. IS LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON.

Item 24 Easement granted to Columbus Southern Power Co. appearing of record in Official Record Volume 627, page 649, Recorder's Office, Delaware County, Ohio. 10' EASEMENT IS LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON.

Item 25 Easement of record in Deed Book 217, page 659, Recorder's Office, Delaware County, Ohio. THE LOCATION OF THE EASEMENT CAN NOT BE DETERMINED FROM THE DESCRIPTION PROVIDED.

Item 26 Easement of record in Deed Book 217, page 674, Recorder's Office, Delaware County, Ohio. THE LOCATION OF THE EASEMENT CAN NOT BE DETERMINED FROM THE DESCRIPTION PROVIDED.

Item 27 Easement of record in Deed Book 523, page 73, Recorder's Office, Delaware County, Ohio. 5' EASEMENT IS LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON.

Item 28 Easement of record in Deed Book 342, page 45, Recorder's Office, Delaware County, Ohio. 16' EASEMENT IS LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON.

Item 29 Easement of record in Deed Book 366, page 647, Recorder's Office, Delaware County, Ohio. THE SUBJECT TRACT IS LOCATED IN THE AREA DESCRIBED AND THE 12' EASEMENT IS CENTERED ON WATERLINE AS INSTALLED NOT PLOTTED.

Item 30 Platted Building Setback Lines per recorded plat of subdivision of record in Plat Cabinet 2, Slides 245, 245A-245B, Recorder's Office, Delaware County, Ohio. BUILDING SETBACK LINES ARE LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON.

Item 31 Platted utility easements per recorded plat of subdivision of record in Plat Cabinet 2, Slides 245, 245A-245B, Recorder's Office, Delaware County, Ohio. NOTE: THIS EXCEPTION IS SOLELY BENEFICIAL TO THE SUBJECT PROPERTY.

Item 32 Subject to terms and conditions of Agreement of Restrictive Covenant by and between SSA LTD., an Ohio limited liability company and JLP-ME Sawmill LLC, an Ohio limited liability company, dated May 9, 2012, filed for record on May 21, 2012 of record in Official Record Book 1122, page 1528, Recorder's Office, Delaware County, Ohio. SUBJECT TRACT IS LOCATED IN THE AREA DESCRIBED.

Item 33-36 NOT SURVEY RELATED ITEMS.

Additional items not included in the Title Commitment.

A. Non-Disturbance Agreement appearing of record in Official Record Volume 20, page 734, Recorder's Office, Delaware County, Ohio. IS LOCATED ON THE SUBJECT TRACT AS SHOWN HEREON.

B. Surveyor's Affidavit, as per Plat Cabinet 2, page 278, Recorder's Office, Delaware County, Ohio. THE SUBJECT TRACT IS LOCATED IN THE AREA DESCRIBED.

CERTIFICATION: Commitment No. 30625

To: First American Title Insurance Company, Schottenstein Real Estate Group LLC, an Ohio limited liability company.

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2011 "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys", jointly established and adopted by ALTA and NSPS, and includes Items 1, 3, 4, 7(a), 8, 9 11(a), and 13 of Table A thereof. Field work was completed on June 29, 2012.

UTILITY STATEMENT:

The utilities shown hereon have been located from field survey information and existing drawings. The surveyor makes no guarantee that the utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from information available.

BASIS OF BEARINGS:

The bearings shown on this plat are based on the Ohio State Plane Coordinate System, North Zone, NAD83 (2011). Said bearings originated from a field traverse which was tied (referenced) to said coordinate system by GPS observations and observations of selected CORS base stations in the National Spatial Reference System. The portion of the easterly right-of-way line of Bunker Lane, having a bearing of North 02°46'39" East and monumented as shown hereon, is designated the "basis of bearing" for this survey.

SURVEY NOTE:

This survey was prepared using documents of record, prior plats of survey, and observed evidence located by an actual field survey in June 2012.

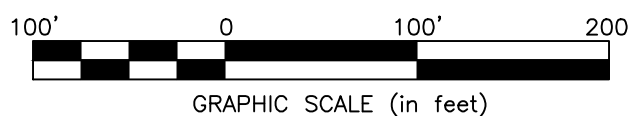
FEMA NOTE:

According to the Federal Emergency Management Agency's Flood Insurance Map (dated April 16, 2012), the subject tract shown hereon lies within Zone X (areas determined to be outside of the 0.2% annual chance floodplain), Community Panel No.39041C0237K.

PARKING NOTE:

There are no marked parking areas on the subject tract.

- = STONE FND.
 - = MON. FND.
 - = I.P. FND.
 - = I.P. SET
 - = MAG. NAIL FND.
 - = MAG. NAIL SET
 - ▲ = R.R. SPK. FND.
 - △ = R.R. SPK. SET
 - = P.K. NAIL FND.
- I.P. Set are 13/16" I.D. iron pipe with cap inscribed EMHT INC

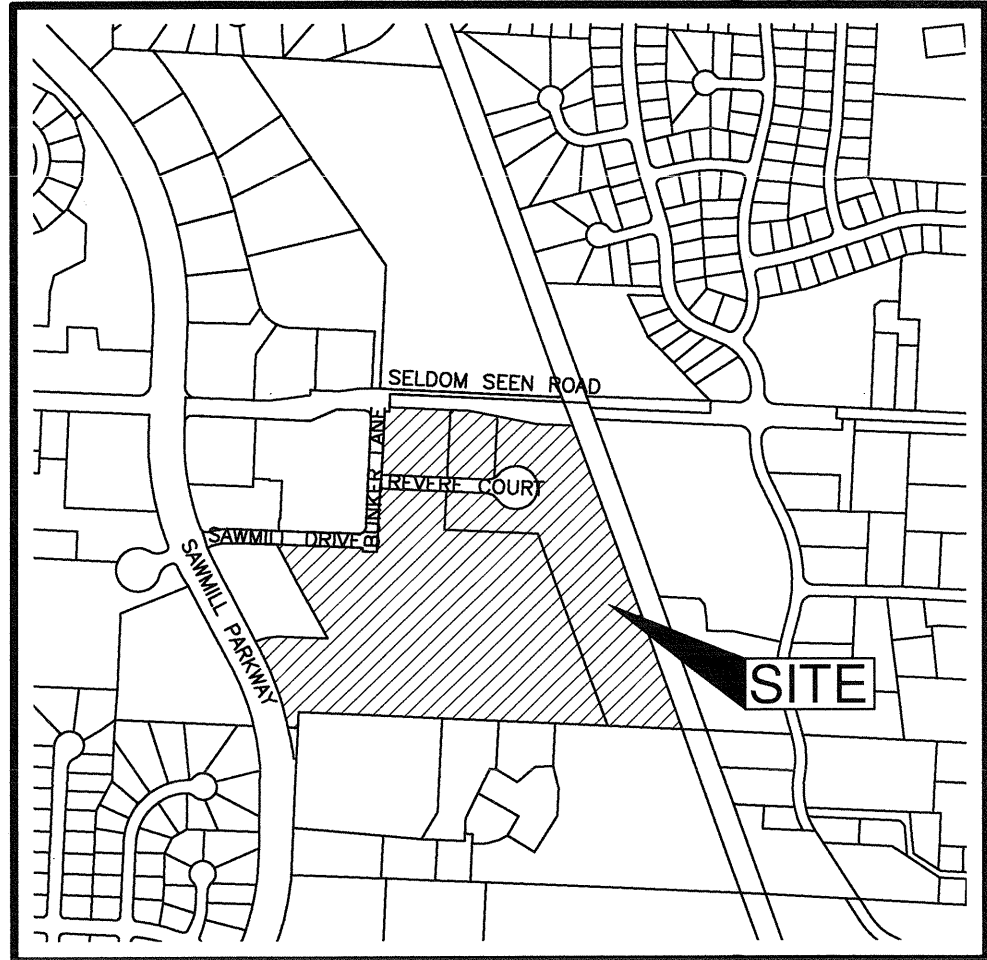


EMHT Evans, Mechwart, Hamilton & Tilton, Inc. Engineers • Surveyors • Planners • Scientists 5800 New Albany Road, Columbus, OH 43254 Phone: 614.775.4500 Toll Free: 888.775.3648 emht.com		Date: May 13, 2015
Scale: 1" = 100'		Job No: 20142045
Sheet: 1 of 1		
REVISIONS		
MARK	DATE	DESCRIPTION

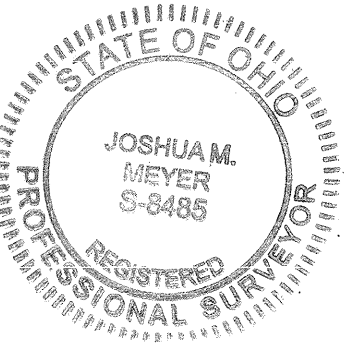
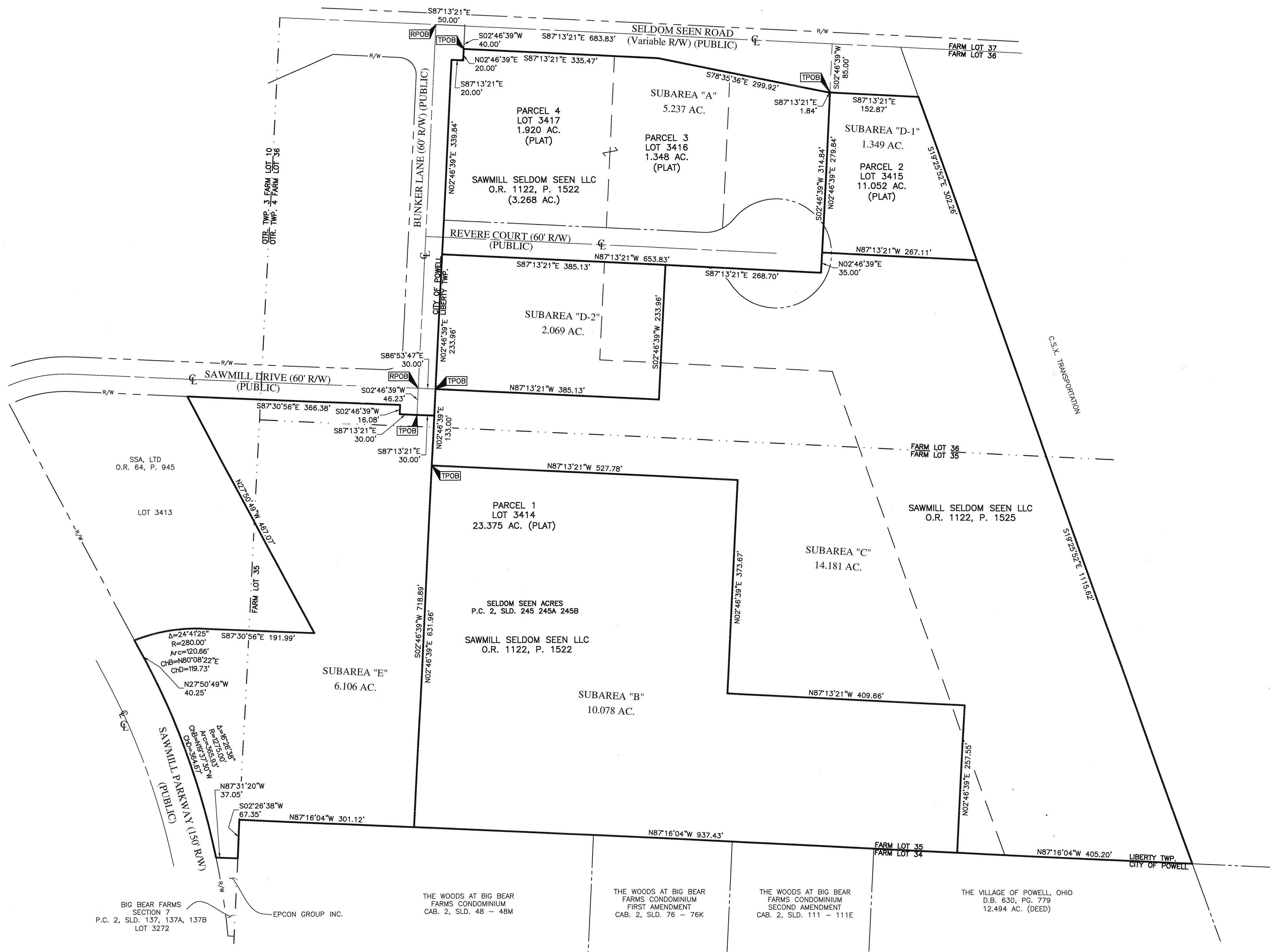
By Joshua M. Meyer
Professional Surveyor No. 8485

Date

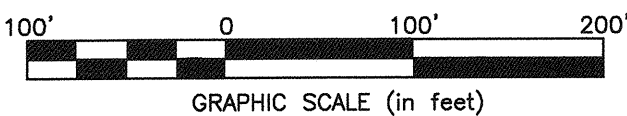
SUBAREA EXHIBIT
FARM LOT 10, QUARTER TOWNSHIP 3, TOWNSHIP 3, RANGE 19
FARM LOTS 35 AND 36 QUARTER TOWNSHIP 4, TOWNSHIP 3, RANGE 19
UNITED STATES MILITARY LANDS
LIBERTY TOWNSHIP, DELAWARE COUNTY, OHIO



LOCATION MAP AND BACKGROUND DRAWING
NOT TO SCALE



By J.M.M. Date 5-13-2015
Joshua M. Meyer
Professional Surveyor No. 8485



EMHT Evans, Mechwart, Hambleton & Tilton, Inc. Engineers • Surveyors • Planners • Scientists 5500 New Albany Road, Columbus, OH 43054 Phone: 614.775.4500 • Toll Free: 888.775.3648 emht.com			Date: May 13, 2015
Scale: 1" = 100'			Job No: 2014-2045
Sheet: 1 of 1			REVISIONS
MARK	DATE	DESCRIPTION	

SUBAREA "A"
5.237 ACRES

Situated in the State of Ohio, County of Delaware, Township of Liberty, located in Farm Lot 36 Quarter Township 4, Township 3, Range 19, United States Military Lands, being all of Lots 3417 and 3416 and part of Lot 3415 and Revere Court of that subdivision entitled "Seldom Seen Acres" of record in Plat Cabinet 2, Slides 245, 245A and 245B, being part of those tracts conveyed to Sawmill Seldom Seen LLC by deeds of record in Official Record 1122, Page 1522 and Official Record 1122, Page 1525, (all references refer to the records of the Recorder's Office, Delaware County, Ohio) being more particularly described as follows:

Beginning, for reference, at the intersection of the centerline of Bunker Lane and the centerline of Seldom Seen Road;

thence South 87° 13' 21" East, with said centerline of Seldom Seen Road, a distance of 50.00 feet to a point;

thence South 02° 46' 39" West, across said Seldom Seen Road, a distance of 40.00 feet to a point in the southerly right-of-way line of said Seldom Seen Road, the TRUE POINT OF BEGINNING;

thence with said southerly right-of-way line, the following courses and distances:

South 87° 13' 21" East, a distance of 335.47 feet to a point;

South 78° 35' 36" East, a distance of 299.92 feet to a point; and

South 87° 13' 21" East, a distance of 1.84 feet to a point;

thence South 02° 46' 39" West, across said Lot 3415 and across Revere Court, a distance of 314.84 feet to a point;

thence North 87° 13' 21" West, continuing across said Revere Court, a distance of 653.83 feet to a point in the easterly right-of-way line of said Bunker Lane;

thence with said easterly right-of-way line, the following courses and distances:

North 02° 46' 39" East, a distance of 339.84 feet to an angle point in said easterly right-of-way line;

South 87° 13' 21" East, a distance of 20.00 feet to an angle point in said easterly right-of-way line; and

North 02° 46' 39" East, a distance of 20.00 feet to the TRUE POINT OF BEGINNING, containing 5.237 acres, more or less.

This description was prepared from document of record, is for zoning purposes only, and is not to be used for transfer.



JMM:mmm
5_237 ac 20142045-subarea-A.doc

EVANS, MECHWART, HAMBLETON & TILTON, INC.

A handwritten signature in blue ink, appearing to read "J M Meyer".

Joshua M. Meyer
Professional Surveyor No. 8485

5-13-2015

Date

SUBAREA "B"
10.078 ACRES

Situated in the State of Ohio, County of Delaware, Township of Liberty, located in Farm Lot 35 Quarter Township 4, Township 3, Range 19, United States Military Lands, being part of Lots 3414 and 3415 of that subdivision entitled "Seldom Seen Acres" of record in Plat Cabinet 2, Slides 245, 245A and 245B, being part of that tract conveyed to Sawmill Seldom Seen LLC by deeds of record in Official Record 1122, Page 1522 and Official Record 1122, Page 1525, (all references refer to the records of the Recorder's Office, Delaware County, Ohio) being more particularly described as follows:

Beginning, for reference, at the intersection of the centerline of Bunker Lane and the centerline of Sawmill Drive;

thence South 86° 53' 47" East, across said Bunker Lane, a distance of 30.00 feet to the easterly right-of-way line of said Bunker Lane;

thence South 02° 46' 39" West, with said easterly right-of-way line and across said Lot 3414, a distance of 133.00 feet to the TRUE POINT OF BEGINNING;

thence South 87° 13' 21" East, continuing across said Lot 3414, a distance of 527.78 feet to a point;

thence South 02° 46' 39" West, continuing across said Lot 3414, a distance of 373.67 feet to a point;

thence South 87° 13' 21" East, continuing across said Lot 3414 and across said Lot 3415, a distance of 409.66 feet to a point;

thence South 02° 46' 39" West, continuing across said Lots 3414 and 3415, a distance of 257.55 feet to a point in the northerly line of that 12.494 acre tract conveyed to The Village of Powell, Ohio by deed of record in Deed Book 630, Page 779;

thence North 87° 16' 04" West, with the line common to said Lot 3414 and said 12.494 acre tract, that tract conveyed to The Woods at Big Bear Farms Condominium Second Amendment by deed of record in Cabinet 2, Slides 111-111E, that tract conveyed to The Woods at Big Bear Farms Condominium First Amendment by deed of record in Cabinet 2, Slides 76-76K and that tract conveyed to The Woods at Big Bear Farms Condominium by deed of record in Cabinet 2, Slides 48-48M, a distance of 937.43 feet to a point;

thence North 02° 46' 39" East, across said Lot 3414, a distance of 631.96 feet to the TRUE POINT OF BEGINNING, containing 10.078 acre, more or less.

This description was prepared from documents of record, is for zoning purposes only, and is not to be used for transfer.

EVANS, MECHWART, HAMBLETON & TILTON, INC.



JMM:mmm
10_078 ac 20142045-subarea-B.doc

A handwritten signature in blue ink, appearing to read "J M. Meyer".

Joshua M. Meyer
Professional Surveyor No. 8485

5-13-2015

Date

SUBAREA "C"
14.181 ACRES

Situated in the State of Ohio, County of Delaware, Township of Liberty, located in Farm Lots 35 and 36 Quarter Township 4, Township 3, Range 19, United States Military Lands, being part of Lots 3414 and 3415 and Revere Court of that subdivision entitled "Seldom Seen Acres" of record in Plat Cabinet 2, Slides 245, 245A and 245B, being part of that tract conveyed to Sawmill Seldom Seen LLC by deeds of record in Official Record 1122, Page 1522 and Official Record 1122, Page 1525, (all references refer to the records of the Recorder's Office, Delaware County, Ohio) being more particularly described as follows:

Beginning, for reference, at the intersection of the centerline of Bunker Lane and the centerline of Sawmill Drive;

thence South 86° 53' 47" East, across said Bunker Lane, a distance of 30.00 feet to the easterly right-of-way line of said Bunker Lane, the TRUE POINT OF BEGINNING;

thence South 87° 13' 21" East, across said Lot 3414, a distance of 385.13 feet to a point;

thence North 02° 46' 39" East, continuing across said Lot 3414 and across said Lot 3415 and Revere Court, a distance of 233.96 feet to a point;

thence South 87° 13' 21" East, across said Revere Court, a distance of 268.70 feet to a point;

thence North 02° 46' 39" East, continuing across said Revere Court, a distance of 35.00 feet to a point;

thence South 87° 13' 21" East, continuing across said Revere Court and across said Lot 3415, a distance of 267.11 feet to a point in the westerly line of that tract conveyed to C.S.X. Transportation;

thence South 19° 25' 52" East, with the line common to said C.S.X. Transportation and Lot 3415, a distance of 1115.62 feet to the northeasterly corner of that 12.494 acre tract conveyed to The Village of Powell, Ohio by deed of record in Deed Book 630, Page 779;

thence North 87° 16' 04" West, with the line common to said Lot 3415 and said 12.494 acre tract and the line common to said Lot 3414 and said 12.494 acre tract, a distance of 405.20 feet to a point;

thence North 02° 46' 39" East, across said Lots 3414 and 3415, a distance of 257.55 feet to a point;

thence North 87° 13' 21" West, continuing across said Lots 3414 and 3415, a distance of 409.66 feet to a point;

thence North 02° 46' 39" East, across said Lot 3414, a distance of 373.67 feet to a point;

thence North 87° 13' 21" West, continuing across said Lot 3414, a distance of 527.78 feet to a point;

thence North 02° 46' 39" East, continuing across said Lot 3414 and with said easterly right-of-way line, a distance of 133.00 feet to the TRUE POINT OF BEGINNING, containing 14.181 acres, more or less.

This description was prepared from documents of record, is for zoning purposes only, and is not to be used for transfer.



JMM:mm
14_181 ac 20142045-subarea-C.doc

EVANS, MECHWART, HAMBLETON & TILTON, INC.

A handwritten signature in blue ink, appearing to read "J. M. Meyer", written over the printed name.

Joshua M. Meyer
Professional Surveyor No. 8485

5-13-2015

Date

SUBAREA "D-1"
1.349 ACRES

Situated in the State of Ohio, County of Delaware, Township of Liberty, located in Farm Lot 36 Quarter Township 4, Township 3, Range 19, United States Military Lands, being part of Lot 3415 and Revere Court of that subdivision entitled "Seldom Seen Acres" of record in Plat Cabinet 2, Slides 245, 245A and 245B, being part of that tract conveyed to Sawmill Seldom Seen LLC by deed of record in Official Record 1122, Page 1525, (all references refer to the records of the Recorder's Office, Delaware County, Ohio) being more particularly described as follows:

Beginning, for reference, at the intersection of the centerline of Bunker Lane and the centerline of Seldom Seen Road;

thence South 87° 13' 21" East, with said centerline of Seldom Seen Road, a distance of 683.83 feet to a point;

thence South 02° 46' 39" West, across said Seldom Seen Road, a distance of 85.00 feet to a point in the southerly right-of-way line of said Seldom Seen Road, the TRUE POINT OF BEGINNING;

thence South 87° 13' 21" East, with said southerly right-of-way line, a distance of 152.87 feet to the northeast corner of said Lot 3415, in the westerly line of that tract conveyed to C.S.X. Transportation;

thence South 19° 25' 52" East, with the line common to said Lot 3415 and said C.S.X. Transportations tract, a distance of 302.26 feet to a point;

thence North 87° 13' 21" West, across said Lot 3415 and across Revere Court, a distance of 267.11 feet to a point;

thence North 02° 46' 39" East, continuing across said Revere Court and said Lot 3415, a distance of 279.84 feet to the TRUE POINT OF BEGINNING, containing 1.349 acres, more or less.

This description was prepared from documents of record, is for zoning purposes only, and is not to be used for transfer.



JMM:mmm
1_349 ac 20142045-subarea-D1.doc

EVANS, MECHWART, HAMBLETON & TILTON, INC.

A handwritten signature in blue ink, appearing to read "J. M. Meyer".

5-13-2015

Joshua M. Meyer
Professional Surveyor No. 8485

Date

SUBAREA "D-2"
2.069 ACRES

Situated in the State of Ohio, County of Delaware, Township of Liberty, located in Farm Lot 36 Quarter Township 4, Township 3, Range 19, United States Military Lands, being part of Lots 3414 and 3415 and Revere Court of that subdivision entitled "Seldom Seen Acres" of record in Plat Cabinet 2, Slides 245, 245A and 245B, being part of that tract conveyed to Sawmill Seldom Seen LLC by deeds of record in Official Record 1122, Page 1522 and Official Record 1122, Page 1525, (all references refer to the records of the Recorder's Office, Delaware County, Ohio) being more particularly described as follows:

Beginning, for reference, at the intersection of the centerline of Bunker Lane and the centerline of Sawmill Drive;

thence South 86° 53' 47" East, across said Bunker Lane, a distance of 30.00 feet to a point in the easterly right-of-way line of said Bunker Lane, the TRUE POINT OF BEGINNING;

thence North 02° 46' 39" East, with said easterly right-of-way line, a distance of 233.96 feet to a point;

thence South 87° 13' 21" East, across Revere Court, a distance of 385.13 feet to a point;

thence South 02° 46' 39" West, continuing across Revere Court and said Lots 3414 and 3415, a distance of 233.96 feet to a point;

thence North 87° 13' 21" West, continuing across said Lot 3414, a distance of 385.13 feet to the TRUE POINT OF BEGINNING, containing 2.069 acres, more or less.

This description was prepared from documents of record, is for zoning purposes only, and is not to be used for transfer.



JMM:mmm
2_069 ac 20142045-subarea-D2.doc

EVANS, MECHWART, HAMBLETON & TILTON, INC.

A handwritten signature in blue ink, appearing to read "J M - 4", located below the printed name of the surveyor.

Joshua M. Meyer
Professional Surveyor No. 8485

5-13-2015

Date

SUBAREA "E"
6.106 ACRES

Situated in the State of Ohio, County of Delaware, Township of Liberty, located in Farm Lots 35 and 36 Quarter Township 4, Township 3, Range 19, and Farm Lot 10, Quarter Township 3, Township 3, Range 19, United States Military Lands, being part of Lot 3414 of that subdivision entitled "Seldom Seen Acres" of record in Plat Cabinet 2, Slides 245, 245A and 245B, being part of that tract conveyed to Sawmill Seldom Seen LLC by deed of record in Official Record 1122, Page 1522, (all references refer to the records of the Recorder's Office, Delaware County, Ohio) being more particularly described as follows:

Beginning, for reference, at the intersection of the centerline of Bunker Lane and the centerline of Sawmill Drive;

thence South $02^{\circ} 46' 39''$ West, with said centerline of Bunker Lane, a distance of 46.23 feet to a point in the northerly line of said Lot 3414, the TRUE POINT OF BEGINNING;

thence South $87^{\circ} 13' 21''$ East, with the northerly line of said Lot 3414, a distance of 30.00 feet to a point in the easterly right-of-way line of said Bunker Lane;

thence South $02^{\circ} 46' 39''$ West, across said Lot 3414, a distance of 718.89 feet to a point in the northerly line of that tract conveyed to The Woods at Big Bear Farms Condominium by deed of record in Cabinet 2, Slides 48-48M;

thence North $87^{\circ} 16' 04''$ West, with the line common to said Lot 3414 said The Woods at Big Bear Farms Condominium tract, a distance of 301.12 feet to the northwesterly corner of said The Woods at Big Bear Farms Condominium;

thence South $02^{\circ} 26' 38''$ West, continuing with said common line, a distance of 67.35 feet to the northeasterly corner of Lot 3272 of that subdivision entitled "Big Bear Farms Section 7" of record in Plat Cabinet 2, Slides 137, 137A and 137B;

thence North $87^{\circ} 31' 20''$ West, with the line common to said Lots 3414 and 3272, a distance of 37.05 feet to a point in the easterly right-of-way line of Sawmill Parkway;

thence continuing with said easterly right-of-way line, with the arc of a curve to the left, having a central angle of $16^{\circ} 26' 38''$, a radius of 1275.00 feet, an arc length of 365.93 feet, a chord bearing of North $19^{\circ} 37' 30''$ West and chord distance of 364.67 feet a point of tangency;

thence North $27^{\circ} 50' 49''$ West, continuing with said easterly right-of-way line of Sawmill Parkway, a distance of 40.25 feet to the southwesterly corner of Lot 3413 of said "Seldom Seen Acres";

thence with the line common to said Lots 3414 and 3413, the following courses and distance:

with the arc of a curve to the right, having a central angle of $24^{\circ} 41' 25''$, a radius of 280.00 feet, an arc length of 120.66 feet, a chord bearing of North $80^{\circ} 08' 22''$ East and chord distance of 119.73 feet to a point of tangency;

South $87^{\circ} 30' 56''$ East, a distance of 191.99 feet to the southeasterly corner of said Lot 3413; and

North $27^{\circ} 50' 49''$ West, a distance of 467.07 feet to a point in the southerly right-of-way line of said Sawmill Drive;

thence South $87^{\circ} 30' 56''$ East, with said southerly right-of-way line, a distance of 366.38 feet to a point in the westerly right-of-way line of said Bunker Lane;

South $02^{\circ} 46' 39''$ West, with said westerly right-of-way line, a distance of 16.08 feet to a point;

thence South $87^{\circ} 13' 21''$ East, with the northerly line of said Lot 3414, a distance of 30.00 feet to the TRUE POINT OF BEGINNING, containing 6.106 acres, more or less.

This description was prepared from documents of record, is for zoning purposes only, and is not to be used for transfer.

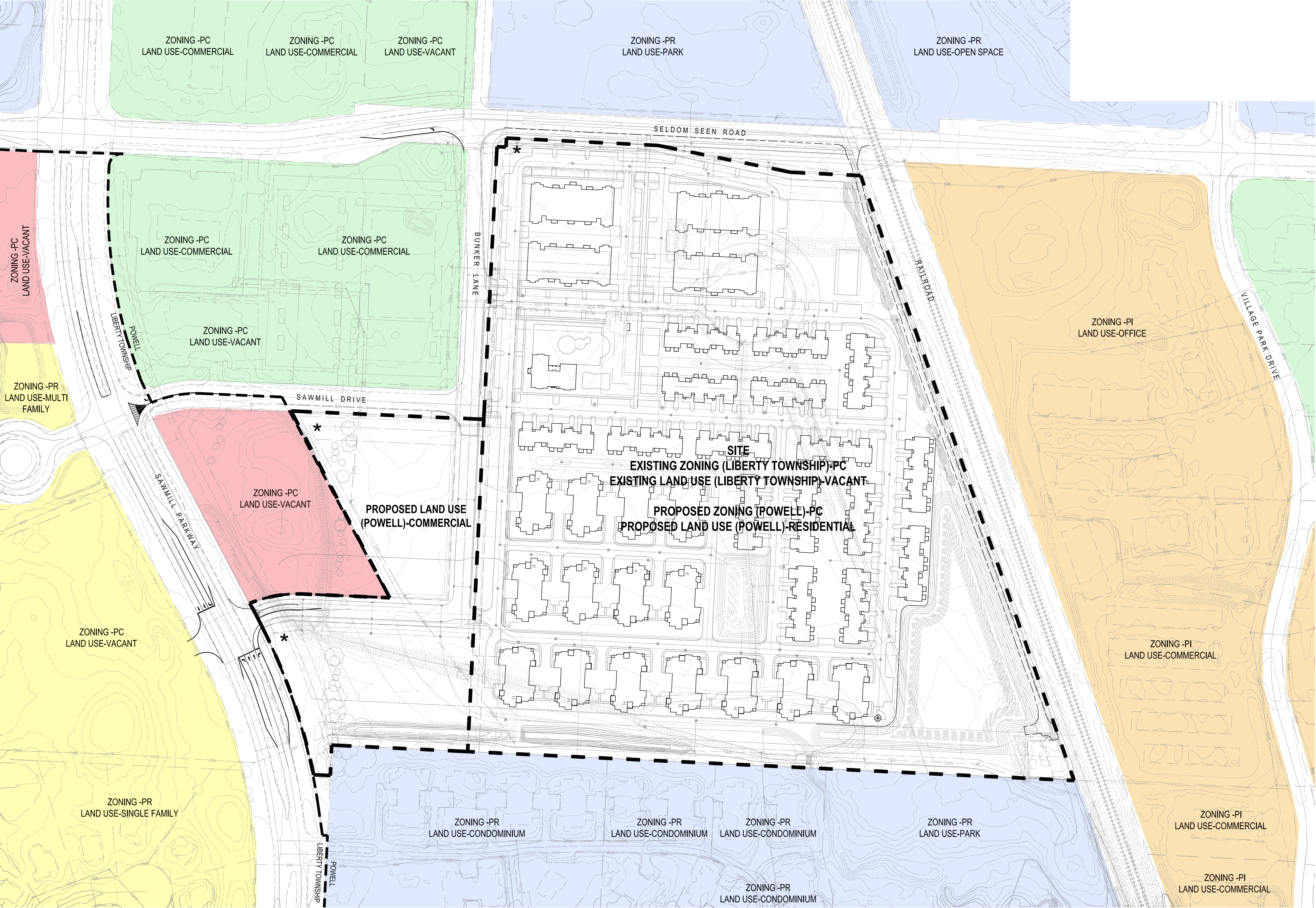


EVANS, MECHWART, HAMBLETON & TILTON, INC.

Joshua M. Meyer
Professional Surveyor No. 8485

5-13-2015

Date



PRELIMINARY NOT FOR CONSTRUCTION

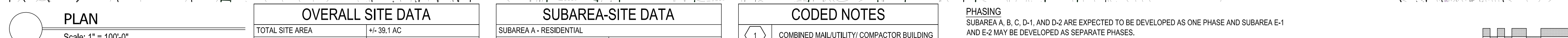
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job no: 6285150010

date: 05/20/2015

sheet:

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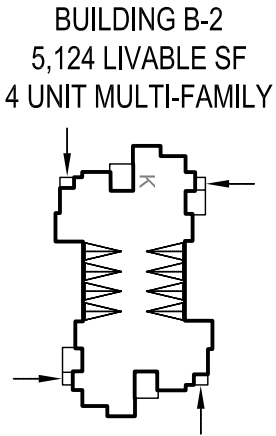
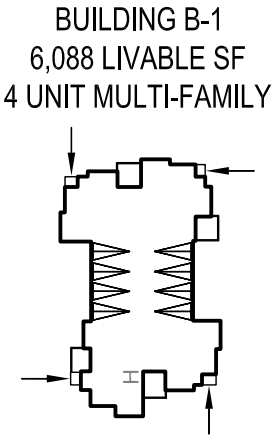
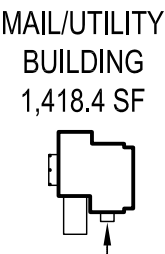
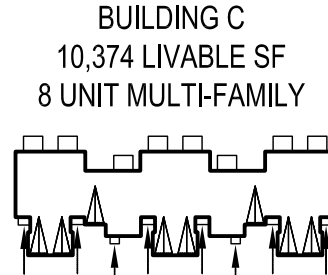
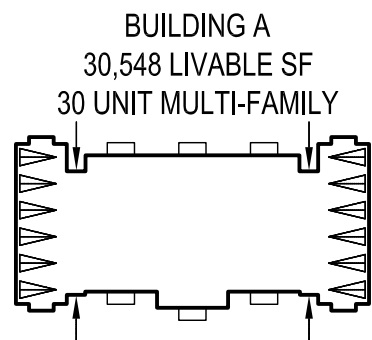
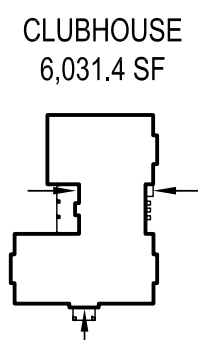
SUBAREA-SITE DATA	
SUBAREA A - RESIDENTIAL	
ACREAGE	+/-5.24 AC
UNITS	120 D.U.
PARKING PROVIDED	300 spaces (2.5 spaces/unit)
SUBAREA B - RESIDENTIAL	
ACREAGE	+/-10.1 AC
UNITS	60 D.U.
PARKING PROVIDED	246 spaces (4 spaces/unit)
SUBAREA C - RESIDENTIAL	
ACREAGE	+/-14.2 AC
UNITS	128 D.U.
PARKING PROVIDED	401 spaces (3 spaces/unit)
SUBAREA D-1 - OPEN SPACE	
ACREAGE	+/-1.35 AC
SUBAREA D-2 - CLUBHOUSE/AMENITIES	
ACREAGE	+/-2.1 AC
SUBAREA E-1 - COMMERCIAL	
ACREAGE	+/-2.3 AC
SUBAREA E-2 - COMMERCIAL	
ACREAGE	+/-2.6 AC

CODED NOTES	
1	COMBINED MAIL/UTILITY/ COMPACTOR BUILDING
2	8' ASPHALT BIKE PATH (TYP.)
3	CLUBHOUSE
4	POOL
5	PATIO/ENTERTAINMENT SPACE
6	PUTTING GREEN
7	COMMUNITY GARDEN
8	DOG PARK
9	GAZEBO/PATIO
10	4' CONCRETE SIDEWALK (TYP.)
11	ENTRY GATE

PROPOSED STRUCTURES

→ ENTRANCEWAYS

▷ GARAGES

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date: 05/20/2015
sheet:

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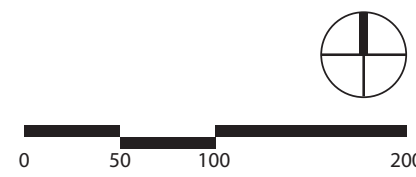
CONCEPT PLAN

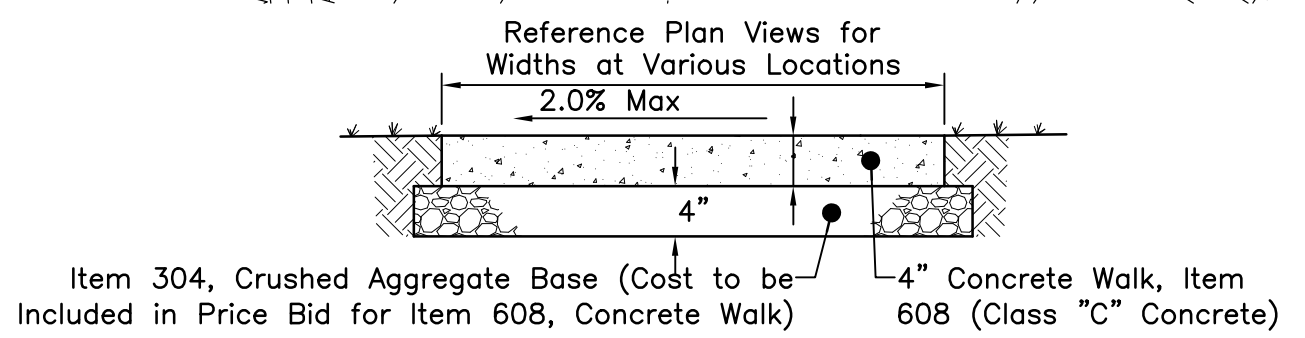
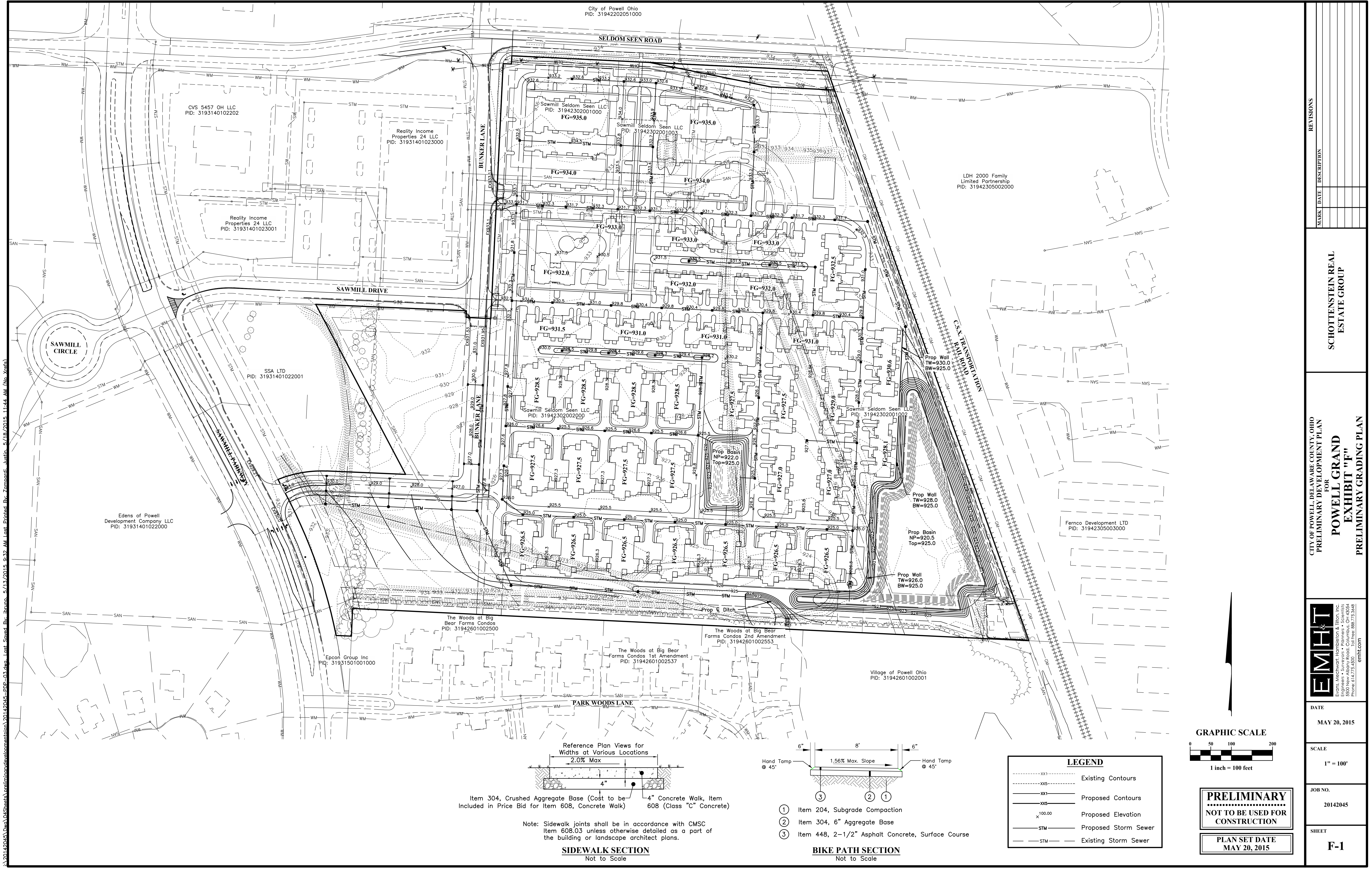
SITE DATA

Total Site Area:	+/- 39.1 ac
Public ROW:	+/- 1.2 ac
Net Site Area:	+/- 37.9 ac
Subareas A,B,C,D-1,D-2:	+/- 33.0 ac
Multifamily Residential	
• Building A:	4 BLDG.
Large Senior 1 and 2 Bedroom Suites with Elevators, and Individual Garages:	120 Units
Parking Provided:	300 spaces (2.5 sp/du)
• Building B:	15 BLDG.
2 and 3 Bedroom Ranch Homes with 2-Car Garages:	60 Units
Parking Provided:	246 spaces (4 sp/du)
• Building C:	16 BLDG.
2 and 3 Bedroom 2 Story Townhomes with 1 Car Garages:	128 Units
Parking Provided:	401 spaces (3.1 sp/du)
Total Units:	308 Units
Density (Net Site Area):	+/- 8.1 du/ac
Parking Required (3 spaces/1 unit):	924 spaces
Parking Provided:	+/- 947 spaces
<small>*Parking provided includes garage spaces, driveway stacking spaces, and surface parking spaces.</small>	
Clubhouse Parking Provided:	95 spaces
Open Space	
Open Space Required:	+/- 6.6 ac (20%)
Open Space Provided:	+/- 10.6 ac (32%)
Subareas E-1&E-2	
Commerical Outparcels (2 Lots):	+/- 5.0 ac

- Pursuant to the requirements of City of Powell Zoning Code section 1145.29, (c) and (d), existing trees within the development footprint will be surveyed and trees that are unable to be preserved will be replaced per code.
- This property has been used for agriculture historically, therefore no natural watercourses traverse the site within the property boundaries. The headwater for Bartholomew Run is located at the southeast corner of the project and will be the discharge point for the site. A storm water basin will be located near this location to provide erosion and sediment control during construction and storm water quantity and quality control post a construction. The two man-made watercourses crossing the site will be filled and piped as part of the development process.

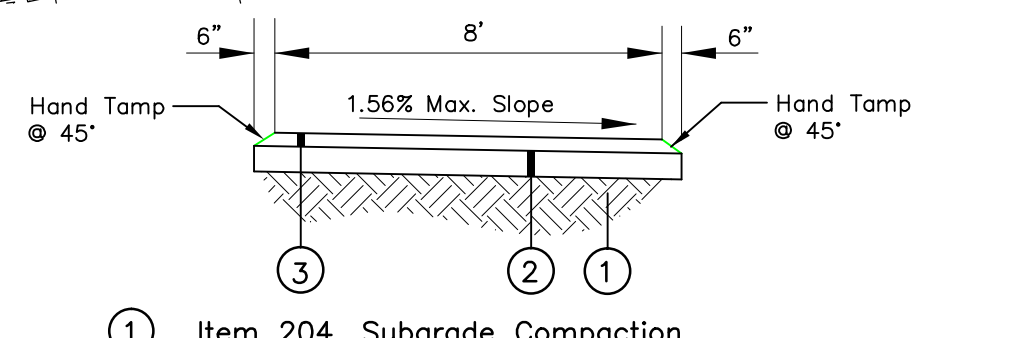
* Desired Sign Locations





Note: Sidewalk joints shall be in accordance with CMSC Item 608.03 unless otherwise detailed as a part of the building or landscape architect plans.

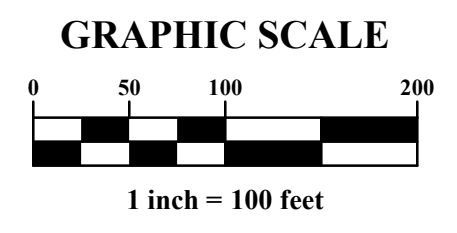
SIDEWALK SECTION
Not to Scale



- ① Item 204, Subgrade Compaction
- ② Item 304, 6" Aggregate Base
- ③ Item 448, 2-1/2" Asphalt Concrete, Surface Course

BIKE PATH SECTION
Not to Scale

LEGEND	
---XXI---	Existing Contours
---XXS---	Proposed Contours
x100.00	Proposed Elevation
---STM---	Proposed Storm Sewer
---STM---	Existing Storm Sewer



PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

PLAN SET DATE
MAY 20, 2015

MARK	DATE	DESCRIPTION

SCHOTTENSTEIN REAL ESTATE GROUP

CITY OF POWELL, DELAWARE COUNTY, OHIO
PRELIMINARY DEVELOPMENT PLAN
FOR
POWELL GRAND EXHIBIT "F"
PRELIMINARY GRADING PLAN

EMHT
Evans, Meacham, Hambleton & Titon, Inc.
5500 New Albany Road, Columbus, OH 43254
Phone 614.775.4500 Toll Free 888.775.3448
emht.com

DATE
MAY 20, 2015

SCALE
1" = 100'

JOB NO.
20142045

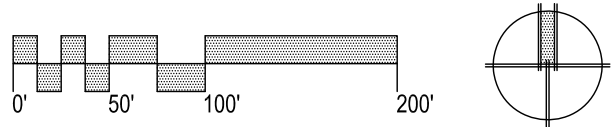
SHEET
F-1



PLAN
Scale: 1" = 100'-0"

LANDSCAPE REQUIREMENTS	
TREE PRESERVATION (1145.29) (9 TREES WITH A MINIMUM TRUNK DIAMETER OF 6" TO BE REMOVED) x 6" = 22 REPLACEMENT TREES AT 2.5" CAL.	
MINIMUM REQUIRED TREES (1145.30) 1/2 IN. TRUNK DIAMETER FOR EVERY 150 SQ. FT. OR FRACTION THEREOF OF BUILDING GROUND COVERAGE, WITH A MINIMUM OF 1 1/2 IN. OF TOTAL TRUNK DIAMETER (BUILDING TYPE SF x NUMBER OF BUILDINGS) / 150 = NUMBER OF 1/2 IN. REQUIRED (NUMBER OF 1/2 IN. REQUIRED) x .5 = (NUMBER OF IN. REQUIRED) / 2.5 = NUMBER OF TREES REQUIRED AT 2.5 CAL.	
BUILDING A	(14,626.02 SF x 4) = 58,504.1 / 150 = 390.03 x .5 = 195.01 / 2.5 = 78 TREES AT 2.5 IN. CAL.
BUILDING B	(8,200.8 SF x 15) = 123,012 / 150 = 820.1 x .5 = 410.04 / 2.5 = 164 TREES AT 2.5 IN. CAL.
BUILDING C	(7732.25 SF x 16) = 123,716 / 150 = 824.8 x .5 = 412.4 / 2.5 = 165 TREES AT 2.5 IN. CAL.
TOTAL NUMBER OF TREES REQUIRED = 407 TREES PROVIDED = 407 TREES	

SAMPLE PLANT LIST					
CODE	COMMON NAME	LATIN NAME		COND.	SPACING
SHADE TREES					
AC JR	AUTUMN BLAZE MAPLE	<i>Acer X freemani 'Jeffer's Red'</i>	2 1/2" CAL.	B&B	PER PLAN
UL MO	MORTON ELM	<i>Ulmus x 'Morton'</i>	2 1/2" CAL.	B&B	PER PLAN
ZE SE	GREEN VASE ZELKOVA	<i>Zelkova serrata 'Green Vase'</i>	2 1/2" CAL.	B&B	PER PLAN
PL BG	BLOODGOOD LONDON PLANE TREE	<i>Platanus x acerfolia 'Bloodgood'</i>	2 1/2" CAL.	B&B	PER PLAN
GL TR	HONEYLOCUST	<i>Gledistia triacanthos inermis</i>	2 1/2" CAL.	B&B	PER PLAN
QU SH	SHUMARD OAK	<i>Quercus shumardii</i>	2 1/2" CAL.	B&B	PER PLAN
KO PA	GOLDEN RAIN TREE	<i>Koelreuteria paniculata</i>	2 1/2" CAL.	B&B	PER PLAN
QU SH	KATSURA TREE	<i>Cercidiphyllum japonicum</i>	2 1/2" CAL.	B&B	PER PLAN
ORNAMENTAL TREES					
MA SS	SPRING SNOW CRABAPPLE	<i>Malus 'Spring Snow'</i>	1 1/2" CAL.	B&B	PER PLAN
AM AB	AUTUMN BRILLIANCE SERVICEBERRY	<i>Amelanchier x grandiflora 'Autumn Brilliance'</i>	1 1/2" CAL.	B&B	PER PLAN
EVERGREEN TREES					
PI AB	NORWAY SPRUCE	<i>Picea abies</i>	6-8' HGT.	B&B	PER PLAN
PI GL	COLORADO BLUE SPRUCE	<i>Picea pungens glauca</i>	6-8' HGT.	B&B	PER PLAN



PRELIMINARY NOT FOR CONSTRUCTION

101 mill street, suite 200
gahanna, ohio 43230
phone: 614.418.0600
www.ohm-advisors.com

OHM

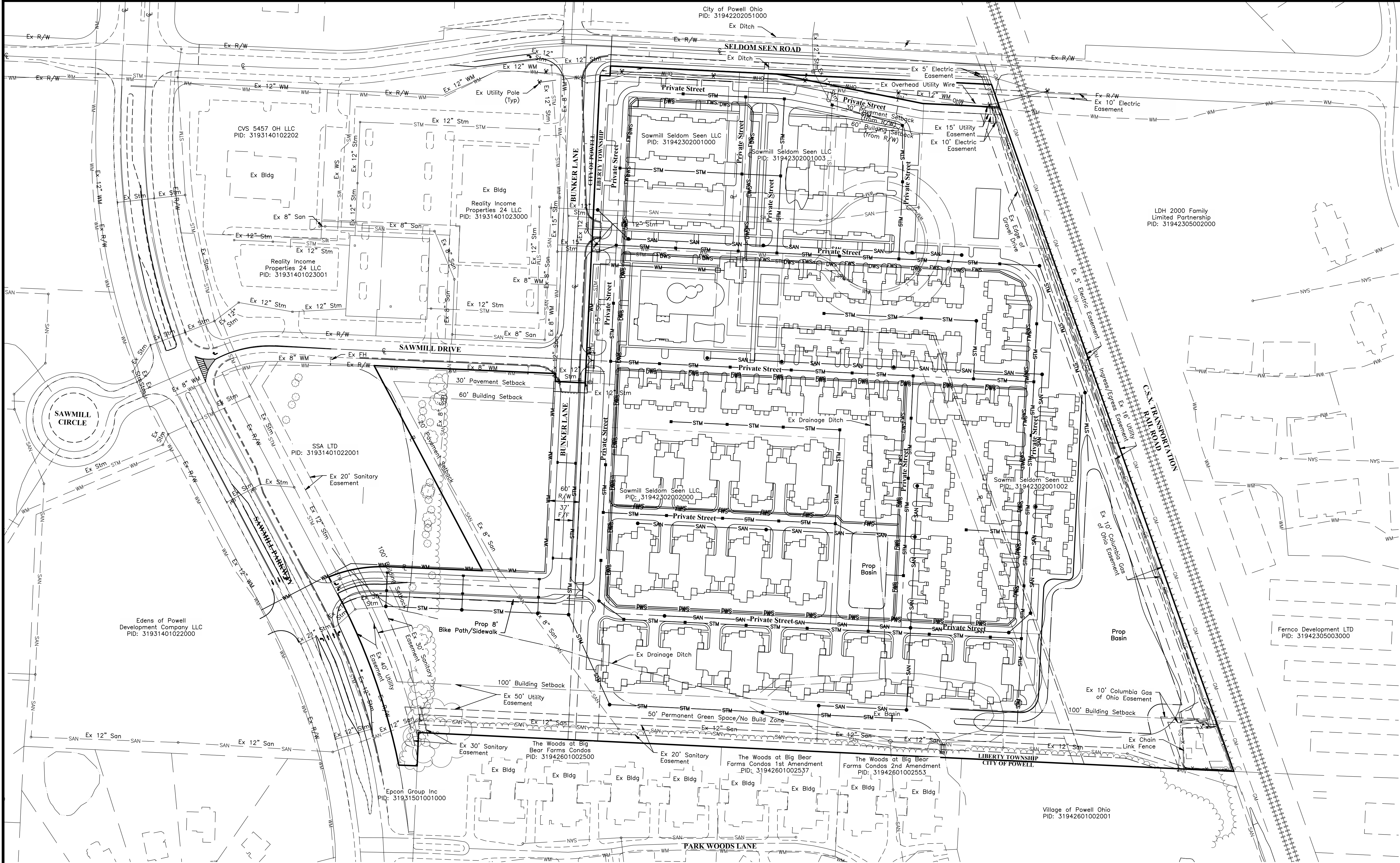
Schottenstein Real Estate Group
Powell Grand
Powell, Ohio
Landscape Plan
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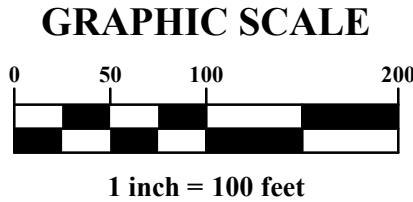
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LEGEND	
STM	Proposed Storm Sewer
SAN	Proposed Sanitary Sewer
WM	Proposed Public Water Main
DWS	Proposed Private Domestic Service
FWS	Proposed Private Fire Protection Main
GM	Existing Gas Main
OHW	Existing Overhead Utility Wires
ExStm	Existing Storm Sewer
ExSan	Existing Sanitary Sewer
ExWM	Existing Watermain



PRELIMINARY
NOT TO BE USED FOR
CONSTRUCTION

PLAN SET DATE
MAY 20, 2015

REVISIONS	
MARK	DESCRIPTION

SCHOTTENSTEIN REAL
ESTATE GROUP

CITY OF POWELL, DELAWARE COUNTY, OHIO
PRELIMINARY DEVELOPMENT PLAN
FOR
POWELL GRAND
EXHIBIT "H"
PRELIMINARY UTILITY PLAN

EMH
Evans, Meacham, Hampton & Hiron, Inc.
5500 New Albany Road, Columbus, OH 43254
Phone 614.775.4500 Toll Free 888.775.3448
emht.com

DATE	MAY 20, 2015
SCALE	1" = 100'
JOB NO.	20142045
SHEET	H-1



MEMO

Date: May 12, 2015
To: City of Powell
From: Patricia Brown, PE
Subject: Powell Grand Exhibit "H" – Utility Feasibility Letter
Copies: Schottenstein Real Estate Group

The following is a summary of the public utility services for the above reference project located at the southeast corner of the intersection of Sawmill Parkway and Seldom Seen Road.

Stormwater Management

The site currently drains from north to southeast to an existing ditch located on The Woods at Big Bear Farms that is tributary to Bartholemew Run. There are two offsite drainage outlets onto the site as well. One storm crossing under Seldom Seen Road that is facilitated to the southeast corner of the site via incomplete infrastructure installed with a failed development of the site and a ditch; The second crossing is under Sawmill Parkway, which is also facilitated to the southeast corner of the site via a ditch.

Currently the stormwater management for the site is planned to be a wet basin. The wet basin will be required to accommodate Ohio EPA post construction water quality and storage requirements. Also, stormwater management will use appropriate measures for the Ohio EPA NPDES requirements during construction activities in the areas of the wet basins.

Furthermore, the two offsite outlets mentioned above will be passed through the site as is currently happening. This will be by new infrastructure which may include new storm sewer, swales, or a combination thereof.

Water Service

Currently, there is a 12-inch waterline along Sawmill Parkway and an 8-inch waterline along Seldom Seen Road. Additionally, there is an 8-inch waterline along Sawmill Drive and Bunker Lane. These lines are both owned and maintained by the Del-Co Water Company Inc. Per a letter dated March 27th, 2015 (attached) potable water is available for this development.

Sanitary Service

Currently, there is an 8-inch sanitary line along Sawmill Drive and Bunker Lane, and an 8-inch sanitary line that runs from Sawmill Drive southeast to a 12-inch sanitary line along the north edge of The Woods at Big Bear Farms. These lines are both owned and maintained by the Delaware County Regional Sewer District. Per a letter dated March 25th, 2015 (attached) sanitary service is available for this development.

Attachment: **Del-Co Water Availability Letter**
 Sanitary Service Availability Letter

Officers

TIMOTHY D. McNAMARA

President

BRUCE A. BLACKSTON

Vice President

ROBERT W. JENKINS

Secy.-Treas.

GLENN MARZLUF

General Manager/CEO

SHANE CLARK

Deputy General Manager



6658 OLENTANGY RIVER ROAD

DELAWARE, OHIO 43015

www.delcowater.com

Phone (740) 548-7746 • Fax (740) 548-6203

Directors

WILLIAM E. COLE

DOUGLAS D. DAWSON

DAVID A. BENDER

J. MICHAEL SHEETS

BRIAN P. COGHLAN

G. MICHAEL DICKEY

PERRY K. TUDOR

March 27, 2015

Tracy Foltz

EMH&T

5500 New Albany Road

Columbus, Ohio 43054

RE: Water Availability
Powell Grand Resort Living

Dear Ms. Foltz:

As requested, this is to inform you that Del-Co Water is able to provide water service to the site described below upon plan approval and payment of the required fees:

Development: Powell Grand Resort Living

Proposed Land Use: Condominium Community (±308 units)

Location: Southeast corner of Sawmill Parkway and Seldom Seen Road

Acreage: ±39.1 acres

This site can be served from existing 8 through 12-inch waterlines located on surrounding roads. Due to the close proximity of the units in this development, it will likely be required to be served by a master meter.

This letter of water availability is valid for a period of one year from the date of this letter. Del-Co makes no guarantee of water availability beyond this period. Contact our Engineering Department if you have any questions on the plan review process, or our Customer Service Department for information on tap fees.

Sincerely,
DEL-CO WATER COMPANY, INC.

Shane F. Clark, P.E.
Engineering Manager



DELAWARE COUNTY
DIVISION OF ENVIRONMENTAL SERVICES
CODE COMPLIANCE • REGIONAL SEWER DISTRICT • SOLID WASTE

TIFFANY A. JENKINS, P.E., DIRECTOR

March 25, 2015

EMH&T
5500 New Albany Rd
Columbus, OH 43054

Attn: Tracy Foltz

Re: **Powell Grand Resort Living**

Dear Tracy,

Pursuant to your request dated March 26, 2015, for a sanitary sewer service availability letter for the above proposed development, we offer the following conditional sanitary sewer availability:

Availability

Sanitary sewer is available at the subject parcel. Availability means that new development on the subject parcel is permitted to connect to the County sewer system provided that there is sufficient capacity for the development, all requirements of the Sanitary Engineer's Office can be met, and the zoning expressly permits, and does not restrict the construction, use, operation, maintenance, repair, expansion, or replacement of all sanitary sewers, structures, and appurtenances.

Capacity

We understand that a total of 230.8 single family homes are sought to be built by the developer based on the development plan provided for Powell Grand Resort Living (48 one bedroom apartments, 228 two bedroom apartments, 32 three bedroom apartments, clubhouse and pool).

The sewer that serves this site does not capacity for these 230.8 units as of the date of this letter. Attached are three sewers highlighted in green that will either need to be enlarged or paralleled to increase the capacity of the sewers system to allow the proposed development.

Capacity is not reserved until such time that a subdivider's agreement is executed between the developer and the Board of Commissioners. Sewer capacity is dynamic and subject to decrease pending ongoing development.

Sewer Location

An existing 12" sanitary trunk sewer is located on the parcel.

Zoning Text / Development Plans

This confirmation of sanitary sewer availability is contingent on final zoning and environmental text for the development which permits, and does not restrict the construction, use, operation, maintenance, repair, expansion, or replacement of all sanitary sewers, structures, and appurtenances.

Jurisdictional Waters Report

To date, we have not received a copy of the Waters of the U.S. Report or a response from USACE. Following receipt of these items we may provide additional comments.

Landscaping / Entrance Features

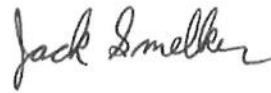
As of the date of this letter, our office has not received landscaping and mounding plans or entrance feature locations. Following the receipt of these items we may provide additional comments which may affect these features.

Additional Comments

The Sanitary Engineer's Office may make additional comments upon review of any subsequent submittals.

If you have any questions, please feel free to contact me.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jack Smelker", with a stylized, cursive script.

Jack Smelker

cc: File



CLUBHOUSE



CLUBHOUSE



BUILDING A



BUILDING B



BUILDING C



REVISIONS

DESCRIPTION

SCHOTTENSTEIN REAL ESTATE GROUP

CITY OF POWELL, DELAWARE COUNTY, OHIO
PRELIMINARY DEVELOPMENT PLAN
FOR
**POWELL GRAND
EXHIBIT "J"**
TREE SURVEY

EMHT
Evans, Meacham, Hamblen & Titon, Inc.
5500 New Albany Road, Columbus, OH 43254
Phone 614.775.4500 Toll Free 888.775.3448
emht.com

DATE
MAY 20, 2015

SCALE
1" = 100'

JOB NO.
20142045

SHEET
J-1

LEGEND

× Tree to be Removed

PRELIMINARY
NOT TO BE USED FOR
CONSTRUCTION

PLAN SET DATE
MAY 20, 2015

I:\2014\2045\Draw\45Sheets\preliminarydevelopmentplan\20142045--PDP--04--05.dwg, Last Saved By: jzampardi, 5/13/2015 7:56 AM Last Printed By: jzampardi, Justin, 5/18/2015 11:44 AM (No Xrefs)

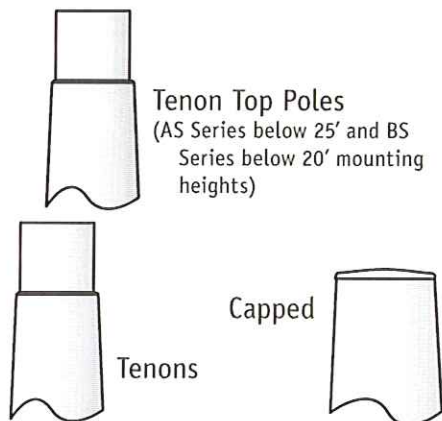
TREE SURVEY DATA TABLE										
TREE NO.	COMMON NAME	SCIENTIFIC NAME	SIZE (IN)	STEMS PER TREE	CONDITION	INDICATOR	REMOVE TREE	INCHES REMOVED	INCHES REPLACED	
1	Eastern Cottonwood	Populus deltoides	6,6,6,6	4	Fair	Deciduous	x	24	24	
2	Sycamore	Platanus occidentalis	6,7	2	Fair	Deciduous	x	13	13	
3	Hackberry	Celtis occidentalis	8	1	Good	Deciduous	x	8	8	
4	Hackberry	Celtis occidentalis	12	1	Fair	Deciduous	x	12	12	
5	Hackberry	Celtis occidentalis	9	1	Good	Deciduous	x	9	9	
6	Hackberry	Celtis occidentalis	13	1	Good	Deciduous	x	13	13	
7	Hackberry	Celtis occidentalis	14	1	Good	Deciduous	x	14	14	
8	Red Oak	Quercus rubra	36	1	Fair	Deciduous	x	36	36	
9	Hackberry	Celtis occidentalis	8,6	2	Good	Deciduous	x	14	14	
10	Red Oak	Quercus rubra	26,19	2	Good	Deciduous		0	0	
11	American Elm	Ulmus americana	13	1	Poor	Deciduous		0	0	
12	American Elm	Ulmus americana	7	1	Fair	Deciduous		0	0	
13	White Oak	Quercus alba	9	1	Fair	Deciduous		0	0	
14	White Oak	Quercus alba	13	1	Fair	Deciduous		0	0	
15	White Oak	Quercus alba	23	1	Fair	Deciduous		0	0	
16	White Oak	Quercus alba	17	1	Fair	Deciduous		0	0	
17	White Oak	Quercus alba	18	1	Good	Deciduous		0	0	
18	White Oak	Quercus alba	27	1	Poor	Deciduous		0	0	
19	White Oak	Quercus alba	8	1	Fair	Deciduous		0	0	
20	White Oak	Quercus alba	7	1	Poor	Deciduous		0	0	
21	White Oak	Quercus alba	13	1	Fair	Deciduous		0	0	
22	Mockernut Hickory	Carya tomentosa	12	1	Fair	Deciduous		0	0	
23	Sugar Maple	Acer saccharum	6	1	Dead	Dead		0	0	
24	White Oak	Quercus alba	32	1	Fair	Deciduous		0	0	
25	White Oak	Quercus alba	58	1	Poor	Deciduous		0	0	
26	Hackberry	Celtis occidentalis	6	1	Fair	Deciduous		0	0	
27	Hackberry	Celtis occidentalis	10	1	Fair	Deciduous		0	0	
28	Mockernut Hickory	Carya tomentosa	6	1	Good	Deciduous		0	0	
29	Green Ash	Fraxinus pennsylvanica	12	1	Dead	Dead		0	0	
30	American Elm	Ulmus americana	7	1	Fair	Deciduous		0	0	
31	White Oak	Quercus alba	8	1	Fair	Deciduous		0	0	
32	Red Oak	Quercus rubra	8	1	Fair	Deciduous		0	0	
33	Red Oak	Quercus rubra	16	1	Good	Deciduous		0	0	
34	Shagbark Hickory	Carya ovata	6	1	Good	Deciduous		0	0	
35	Red Oak	Quercus rubra	21	1	Fair	Deciduous		0	0	
36	Eastern Cottonwood	Populus deltoides	9	1	Good	Deciduous		0	0	
37	Red Oak	Quercus rubra	9	1	Good	Deciduous		0	0	
38	Red Oak	Quercus rubra	8	1	Good	Deciduous		0	0	
39	Shagbark Hickory	Carya ovata	6	1	Fair	Deciduous		0	0	
40	Shagbark Hickory	Carya ovata	6	1	Good	Deciduous		0	0	
41	American Elm	Ulmus americana	7	1	Good	Deciduous		0	0	
42	Red Oak	Quercus rubra	48	1	Fair	Deciduous		0	0	
43	Shagbark Hickory	Carya ovata	6	1	Good	Deciduous		0	0	
44	American Elm	Ulmus americana	9,6	2	Fair	Deciduous		0	0	
45	Green Ash	Fraxinus pennsylvanica	7	1	Dead	Dead		0	0	
46	Green Ash	Fraxinus pennsylvanica	8	1	Dead	Dead		0	0	
47	Green Ash	Fraxinus pennsylvanica	6	1	Dead	Dead		0	0	
48	American Elm	Ulmus americana	7	1	Dead	Dead		0	0	
49	White Oak	Quercus alba	67	1	Fair	Deciduous		0	0	
50	Green Ash	Fraxinus pennsylvanica	9	1	Dead	Dead		0	0	
51	American Elm	Ulmus americana	7	1	Fair	Deciduous		0	0	
52	Eastern Cottonwood	Populus deltoides	28	1	Poor	Deciduous		0	0	
53	Eastern Cottonwood	Populus deltoides	34	1	Poor	Deciduous		0	0	
54	Red Oak	Quercus rubra	8	1	Fair	Deciduous		0	0	
55	Shagbark Hickory	Carya ovata	7	1	Fair	Deciduous		0	0	
56	American Elm	Ulmus americana	6	1	Fair	Deciduous		0	0	
57	Shagbark Hickory	Carya ovata	8,8	2	Good	Deciduous		0	0	
58	American Elm	Ulmus americana	8	1	Good	Deciduous		0	0	
59	Red Oak	Quercus rubra	16	1	Good	Deciduous		0	0	
60	Red Oak	Quercus rubra	16	1	Fair	Deciduous		0	0	
61	Red Oak	Quercus rubra	14	1	Fair	Deciduous		0	0	
62	Green Ash	Fraxinus pennsylvanica	8	1	Dead	Dead		0	0	
63	Green Ash	Fraxinus pennsylvanica	7	1	Dead	Dead		0	0	
64	Sugar Maple	Acer saccharum	14	1	Fair	Deciduous		0	0	
65	Green Ash	Fraxinus pennsylvanica	12	1	Dead	Dead		0	0	
66	Shagbark Hickory	Carya ovata	7	1	Good	Deciduous		0	0	
67	Shagbark Hickory	Carya ovata	7	1	Good	Deciduous		0	0	
68	Green Ash	Fraxinus pennsylvanica	7	1	Dead	Dead		0	0	
69	American Elm	Ulmus americana	6	1	Poor	Deciduous		0	0	
70	Red Oak	Quercus rubra	16	1	Good	Deciduous		0	0	
71	Shagbark Hickory	Carya ovata	8	1	Good	Deciduous		0	0	
72	Green Ash	Fraxinus pennsylvanica	7	1	Dead	Dead		0	0	
73	Green Ash	Fraxinus pennsylvanica	7	1	Dead	Dead		0	0	
74	Shagbark Hickory	Carya ovata	8,6,6	3	Good	Deciduous		0	0	
75	Shagbark Hickory	Carya ovata	20	1	Good	Deciduous		0	0	
76	Shagbark Hickory	Carya ovata	6	1	Fair	Deciduous		0	0	
77	Red Oak	Quercus rubra	14	1	Good	Deciduous		0	0	
78	Green Ash	Fraxinus pennsylvanica	9	1	Dead	Dead		0	0	
79	Red Oak	Quercus rubra	10	1	Good	Deciduous		0	0	
80	Shagbark Hickory	Carya ovata	6	1	Good	Deciduous		0	0	
81	Red Oak	Quercus rubra	7	1	Good	Deciduous		0	0	
82	Green Ash	Fraxinus pennsylvanica	9	1	Dead	Dead		0	0	
83	American Elm	Ulmus americana	13	1	Fair	Deciduous		0	0	
84	Red Oak	Quercus rubra	14	1	Good	Deciduous		0	0	

TREE SURVEY DATA TABLE									
TREE NO.	COMMON NAME	SCIENTIFIC NAME	SIZE (IN)	STEMS PER TREE	CONDITION	INDICATOR	REMOVE TREE	INCHES REMOVED	INCHES REPLACED
85	Green Ash	Fraxinus pennsylvanica	6	1	Dead	Dead		0	0
86	Red Oak	Quercus rubra	7	1	Fair	Deciduous		0	0
87	Red Oak	Quercus rubra	10	1	Fair	Deciduous		0	0
88	Red Oak	Quercus rubra	6	1	Good	Deciduous		0	0
89	Green Ash	Fraxinus pennsylvanica	6	1	Dead	Dead		0	0
90	Sugar Maple	Acer saccharum	6	1	Dead	Dead		0	0
91	Shagbark Hickory	Carya ovata	8	1	Good	Deciduous		0	0
92	Shagbark Hickory	Carya ovata	8	1	Good	Deciduous		0	0
93	Red Oak	Quercus rubra	8	1	Good	Deciduous		0	0
94	Green Ash	Fraxinus pennsylvanica	7	1	Dead	Dead		0	0
95	Shagbark Hickory	Carya ovata	6	1	Fair	Deciduous		0	0
96	Eastern Cottonwood	Populus deltoides	8	1	Fair	Deciduous		0	0
97	Eastern Cottonwood	Populus deltoides	11	1	Fair	Deciduous		0	0
98	Shagbark Hickory	Carya ovata	8	1	Fair	Deciduous		0	0
99	Shagbark Hickory	Carya ovata	7	1	Good	Deciduous		0	0
100	Green Ash	Fraxinus pennsylvanica	9	1	Dead	Dead		0	0
101	Green Ash	Fraxinus pennsylvanica	6	1	Dead	Dead		0	0
102	Osage-Orange	Maclura pomifera	13	1	Poor	Deciduous		0	0
103	Osage-Orange	Maclura pomifera	9	1	Poor	Deciduous		0	0
104	Green Ash	Fraxinus pennsylvanica	11	1	Dead	Dead		0	0
105	Green Ash	Fraxinus pennsylvanica	8	1	Dead	Dead		0	0
106	Green Ash	Fraxinus pennsylvanica	7	1	Dead	Dead		0	0
107	Yellow Buckeye	Aesculus flava	6	1	Fair	Deciduous		0	0
108	Red Oak	Quercus rubra	12	1	Fair	Deciduous		0	0
109	Green Ash	Fraxinus pennsylvanica	8,6	2	Dead	Dead		0	0
110	Green Ash	Fraxinus pennsylvanica	10	1	Dead	Dead		0	0
111	Green Ash	Fraxinus pennsylvanica	10	1	Dead	Dead		0	0
112	American Elm	Ulmus americana	9	1	Fair	Deciduous		0	0
113	Green Ash	Fraxinus pennsylvanica	9,6	2	Dead	Dead		0	0
114	Sugar Maple	Acer saccharum	7	1	Good	Deciduous		0	0
115	Red Oak	Quercus rubra	12	1	Good	Deciduous		0	0
116	Green Ash	Fraxinus pennsylvanica	13	1	Dead	Dead		0	0
117	Sugar Maple	Acer saccharum	7	1	Good	Deciduous		0	0
118	Red Oak	Quercus rubra	13	1	Good	Deciduous		0	0
119	Red Oak	Quercus rubra	13	1	Fair	Deciduous		0	0
120	Red Oak	Quercus rubra	7	1	Fair	Deciduous		0	0
121	American Elm	Ulmus americana	8	1	Poor	Deciduous		0	0
122	Green Ash	Fraxinus pennsylvanica	9	1	Dead	Dead		0	0
123	Green Ash	Fraxinus pennsylvanica	10	1	Poor	Deciduous		0	0
124	Slippery Elm	Ulmus rubra	6	1	Fair	Deciduous		0	0
125	Mockernut Hickory	Carya tomentosa	16	1	Fair	Deciduous		0	0
126	Box Elder	Acer negundo	7	1	Poor	Deciduous		0	0
127	Sugar Maple	Acer saccharum	6	1	Fair	Deciduous		0	0
128	Sweetgum	Liquidambar styraciflua	8	1	Fair	Deciduous		0	0
129	Green Ash	Fraxinus pennsylvanica	15	1	Dead	Dead		0	0
130	American Elm	Ulmus americana	10	1	Poor	Deciduous		0	0
131	Green Ash	Fraxinus pennsylvanica	13,13,13,12	5	Dead	Dead		0	0
132	Red Oak	Quercus rubra	15	1	Poor	Deciduous		0	0
133	Green Ash	Fraxinus pennsylvanica	13	1	Dead	Dead		0	0
134	Hackberry	Celtis occidentalis	20	1	Fair	Deciduous		0	0
135	Green Ash	Fraxinus pennsylvanica	14,14	2	Dead	Dead		0	0
136	White Pine	Pinus strobus	12	1	Fair	Coniferous		0	0
137	White Pine	Pinus strobus	6	1	Fair	Coniferous		0	0
138	Bradford Pear	Pyrus calleryana	8	1	Fair	Deciduous		0	0
139	White Pine	Pinus strobus	8	1	Good	Coniferous		0	0
140	White Pine	Pinus strobus	9	1	Good	Coniferous		0	0
141	White Pine	Pinus strobus	7	1	Good	Coniferous		0	0
142	White Ash	Fraxinus americana	13	1	Dead	Dead		0	0
143	White Ash	Fraxinus americana	13	1	Dead	Dead		0	0
144	White Ash	Fraxinus americana	12	1	Dead	Dead		0	0
145	Red Oak	Quercus rubra	17	1	Good	Deciduous		0	0
146	White Pine	Pinus strobus	7	1	Good	Coniferous		0	0
147	White Pine	Pinus strobus	10	1	Good	Coniferous		0	0
148	White Pine	Pinus strobus	7	1	Good	Coniferous		0	0
149	White Pine	Pinus strobus	8	1	Good	Coniferous		0	0
150	White Pine	Pinus strobus	8	1	Good	Coniferous		0	0
151	White Pine	Pinus strobus	8	1	Good	Coniferous		0	0
152	White Pine	Pinus strobus	9	1	Good	Coniferous		0	0
153	White Pine	Pinus strobus	8	1	Good	Coniferous		0	0
154	Norway Spruce	Picea abies	10	1	Good	Coniferous		0	0
155	Norway Spruce	Picea abies	11	1	Good	Coniferous		0	0
156	White Ash	Fraxinus americana	13	1	Dead	Dead		0	0
157	Hackberry	Celtis occidentalis	13	1	Fair	Deciduous		0	0
158	Hackberry	Celtis occidentalis	7	1	Good	Deciduous		0	0
159	White Ash	Fraxinus americana	6	1	Dead	Dead		0	0
160	White Ash	Fraxinus americana	6	1	Dead	Dead		0	0
161	White Ash	Fraxinus americana	8,7	2	Dead	Dead		0	0
162	White Oak	Quercus alba	19	1	Fair	Deciduous		0	0
			Total Inches Removed						51
			Total Inches To be Replaced (excludes dead/ poor condition trees)						51
			Number of 2.5" Caliper Trees Required for Replacement						20.4

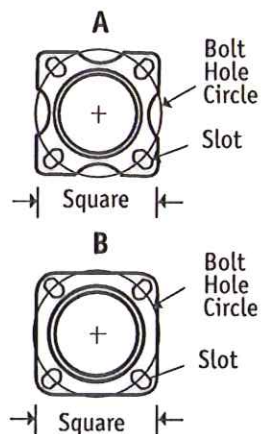
Round Tapered Composite Tuff-Poles®

Tenon Top and Capped

Direct Burial and Anchor Base

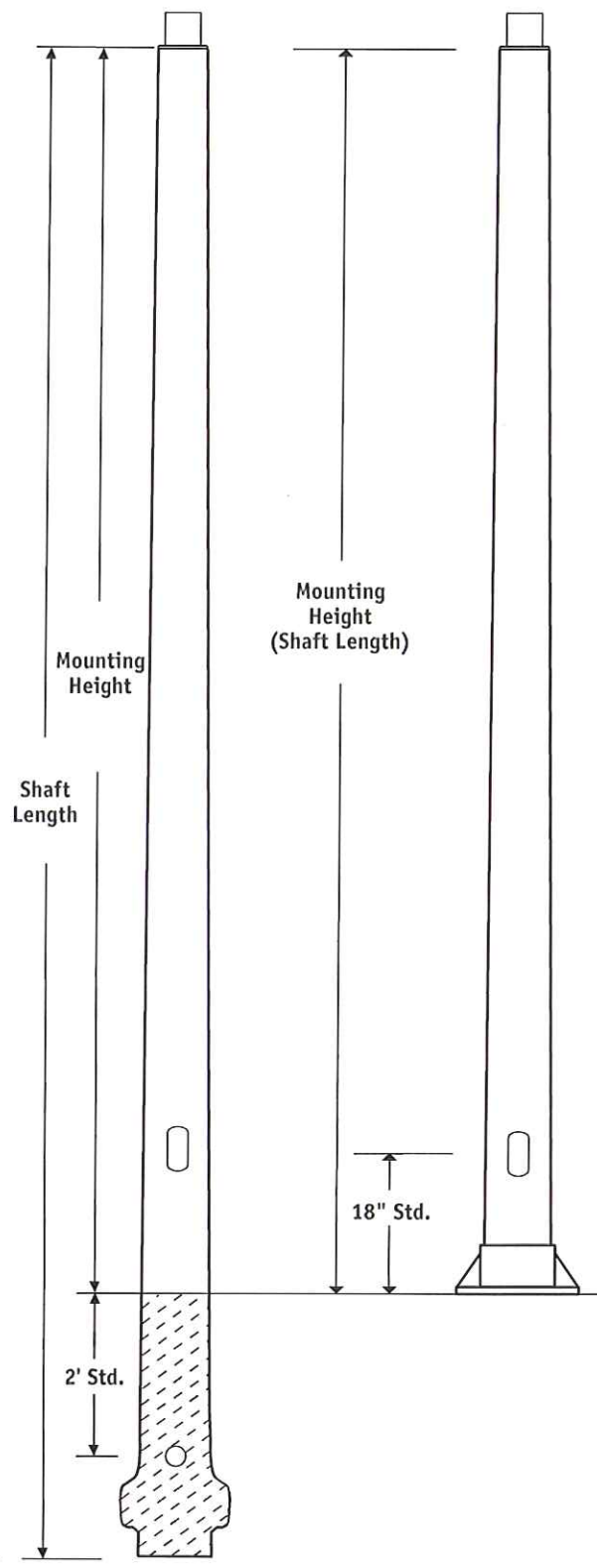
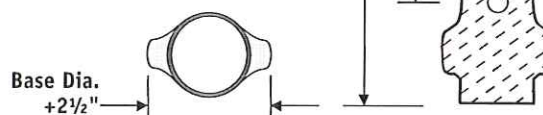


TENONS: 2 3/8", 3", 4" OD, if pole dimensions permit. Tenons are A356-T6 aluminum or hot-dipped galvanized steel, and are available in all standard sizes; for other optional tenons contact Shakespeare. Post top fixtures, flood lights, or brackets mount with ease.



Anchor Base Dimensions

Bolt Hole Circle	Drawing	Square	Slot
8"	A	7.75"	13/16" x 1 5/16"
8 1/2"	A	8.125"	13/16" x 1 5/16"
9 1/2"	A	8.8"	13/16" x 1 5/16"
11 1/2"	B	11"	1 1/4" x 1 3/4"
14"	B	12.9"	1 1/2" x 2"
14 1/2"	B	13.3"	1 1/2" x 2"
15"	B	13.5"	1 1/2" x 2"
15 1/2"	B	14"	1 1/2" x 2"



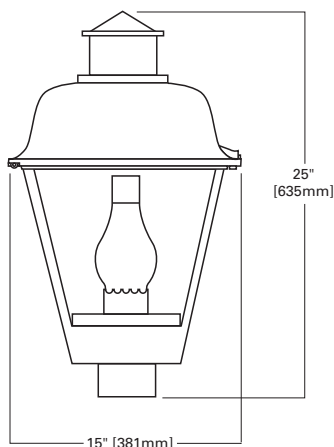
ANCHOR BASE: Cast A356-T6 aluminum, polyurethane coated to match pole color.

Hot dipped galvanized steel anchor bolts complete with nuts (2) and washers (2) are supplied standard (5/8" x 21" x 3", 1" x 30" x 4", or 1 1/4" x 36" x 6" depending on the pole specified).

70-150W

LXD DAYFORM LEXINGTON

POST-TOP AREA LUMINAIRE



DARK SKY
COMPLIANT **CO**
Cutoff



STREETWORKS

SPECIFICATION FEATURES

HOUSING

Die-cast aluminum base housing. Standard color is black. Other finish colors available. Consult your Streetworks Representative. 1" ANSI wattage/source label.

TOP

Hinged die-cast aluminum top with cupola cover.

REFLECTOR

Anodized aluminum reflector with field adjustable socket.

REFRACTOR

Clear acrylic refractor panels.

CHIMNEY

Decorative glass chimney and brass holder.

SCREWS

Captive retaining screw.

STARTER

Plug-in starter.

TERMINAL BLOCK

Terminal block standard.

MOUNTING

Self-aligning pole-top fitter fits 2 3/8" and 3" O.D. tenons. Square headed 1 1/4" polymer coated mounting bolts.

EPA [Effective Projected Area]:
1.7

SHIPPING DATA [Approximate Net Weight]:
25 lbs. [11 kgs.]

ORDERING INFORMATION

SAMPLE NUMBER: LXD70SR2334

PRODUCT FAMILY	LAMP WATTAGE	LAMP TYPE ¹	BALLAST TYPE ¹	VOLTAGE ¹	DISTRIBUTION	COLORS (add as suffix)	OPTIONS (See Below)
LXD=Dayform Lexington	70=70W 10=100W 15=150W	M=Metal Halide ² P=Pulse Start Metal Halide S=High Pressure Sodium	H=Reac./HPF ³ N=Hi. Reac./NPF R=Reac./NPF	2=120V	22=Type II 33=Type III	AP=Grey BZ=Bronze WH=White	

OPTIONS [Must be ordered in alphanumeric order]

OPTIONS (add as suffix)

1=Single Fused, Internally Mounted (120 or 277V)

4=NEMA Photocontrol Receptacle

L=Lamp Included

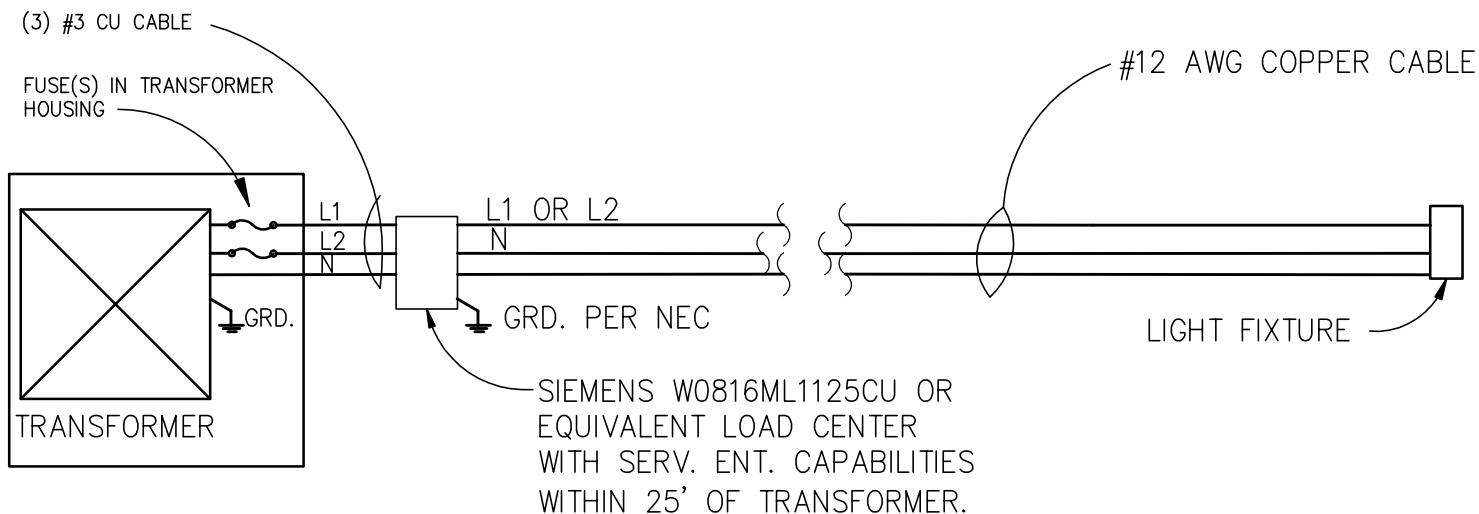
P=Polycarbonate Lens Panels

S=Snap Latches for Toolless Lamp Replacement

U=UL/CSA Listed

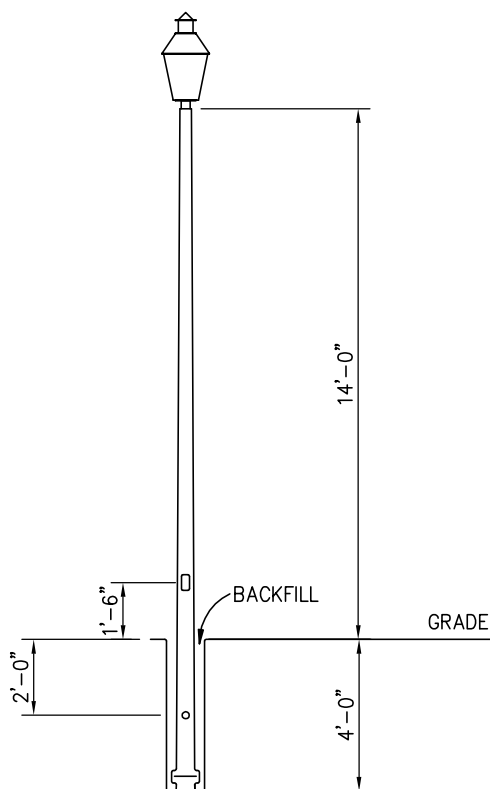
Exhibit K - Lighting Information

NOTE: 1 Refer to technical section for lamp/ballast/voltage compatibility 2 Medium-base porcelain socket standard 3 High Pressure Sodium only 4 Specifications and dimensions subject to change without notice



ELECTRICAL WIRING DIAGRAM

NTS



SITE LIGHTING TYPICAL INSTALLATION

SITE LIGHT DETAIL

DESIGN	DRAWN	CHECKED	APPROVED	DATE	SCALE
AB	AB	DM	ASB	11/02/2010	NONE



NATIONWIDE ENERGY PARTNERS
230 West Street, Suite 200
Columbus, OH 43215
TEL: 614-918-2077

PROJ. NO.

SHEET

REV.

C



MEMO

Date: May 18, 2015
To: City of Powell
From: Patricia Brown, PE
Subject: Powell Grand Exhibit "M" – Existing & Proposed Easements
Copies: Schottenstein Real Estate Group

The following is a summary of the easements and right-of-way for the above referenced project located at the southeast corner of the intersection of Sawmill Parkway and Seldom Seen Road.

Existing Easements & Right-of-Way

An ALTA/ACSM Land Title Survey was prepared for the entire property, refer to Exhibit "B" – ALTA survey. On the north side of the subject property, right-of-way and easements were dedicated with the development of a previous project that was not completed. The existing 60' R/W for Revere Court will be vacated with the development for this project. The existing 20' Sanitary Easement, Item 31 on the ALTA survey, will also be vacated. All remaining existing easements indicated on the ALTA survey will remain in place.

Proposed Easements & Right-of-Way

A proposed 60' R/W will be dedicated for the extension of Bunker Lane to Sawmill Parkway as indicated in Exhibit "E" – Preliminary Development Plan. The coordination of proposed sanitary and storm sewer easements will be established with the Final Engineering Plans.



A legacy of **experience**. A reputation for **excellence**.

5500 New Albany Road
Columbus, Ohio 43054
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**POWELL GRAND SITE
TRAFFIC IMPACT STUDY**

**Schottenstein Real Estate Group/
Margello Development**

June 4, 2015

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Traffic Impact Study
For
Powell Grand Site

Sawmill Parkway and Seldom Seen Road

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June 4, 2015

The traffic engineering data, analysis, findings, and recommendations contained herein and originally produced by EMH&T have been prepared in accordance with accepted Engineering practice and represent anticipated future conditions to the best of our knowledge and belief.



Douglas A. Bender, PE, PTOE
For EMH&T

6/4/15

Date

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1.0 INTRODUCTION

This study has been prepared to determine the transportation impact of developing the Powell Grand senior living site located in the southeast quadrant of the Sawmill Parkway/Seldom Seen Road intersection in Delaware County, Ohio as illustrated in **Figure 1**.

A previous project initiation meeting was held for this site on April 24, 2014 for a different developer and site plan with the following in attendance: Doug Riedel, John Piccin, Rob Riley and Mike Love with the Delaware County Engineer's Office, as well as Jeff Strung and Doug Bender with EMH&T. A previous memorandum of understanding (MOU) dated May 1, 2014 was prepared based on that meeting but has been subsequently updated for this new user and site plan. The updates to the MOU were based on email correspondence and a newly drafted MOU dated March 23, 2015. The MOU approved as the scope for this study update on March 30, 2015, and is included for reference in **Appendix A**.

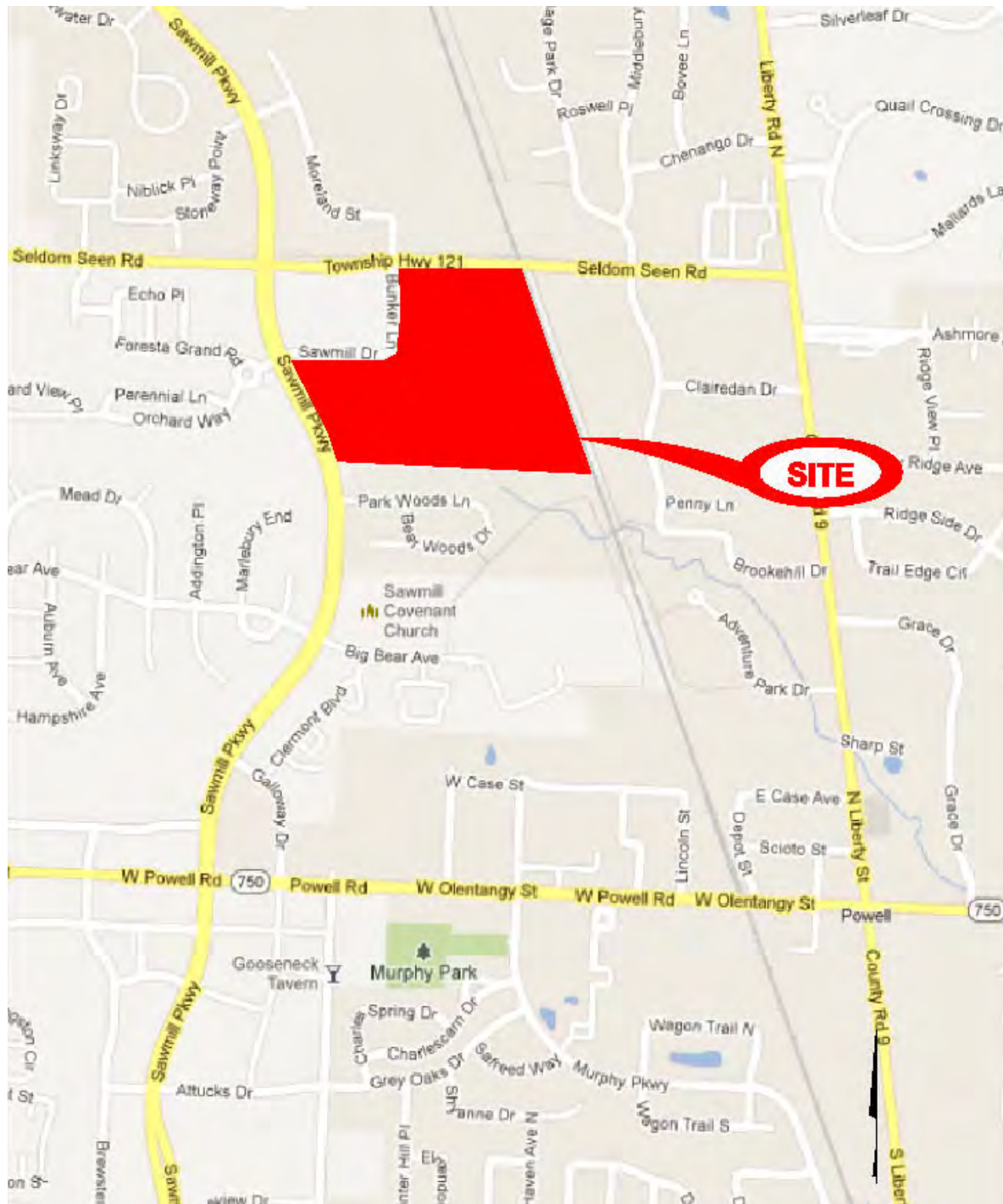
2.0 PROPOSED DEVELOPMENT AND ACCESS PLAN

Site development consists of 308 senior living units as well as a 50,000 square feet of office building space. Both existing access points to the site will remain, including one access to Sawmill Parkway via Sawmill Drive and one access to Seldom Seen Road via Bunker Lane. The study will also consider a new full movement, signalized access to Sawmill Parkway that will be coupled with restricting current Sawmill Drive access to right-in/right-out only operation. The proposed site layout is illustrated in **Exhibit 1**. Site access points are listed below for clarification:

- **Sawmill Parkway**
 - Sawmill Drive (existing full movement, restricted to right-in/right-out upon Site Drive 1 completion)
 - Site Drive 1 (proposed full movement, proposed signal)
- **Seldom Seen Road**
 - Bunker Lane (existing full movement, existing stop control to remain)

All vehicular circulation within the site is proposed on private roadways. At the time of this writing this includes extensions of Sawmill Drive and Bunker Lane as well as the addition of Site Drive 1 from its intersection with Sawmill Parkway into the property. The existing portions of Sawmill Drive and Bunker Lane will remain public, as they are today and the extensions of both of these roadways into the site are planned to be public roads as well. Some variances/adjustments to parking requirements may arise along the new portions of these roadways.

FIGURE 1: Site Location Map



3.0 EXISTING STUDY AREA CONDITIONS

The area of influence identified for this study includes the following intersections:

- Sawmill Parkway/Powell Road (SR 750)
- Sawmill Parkway/Big Bear Avenue
- Sawmill Parkway/Sawmill Drive (convert to Right-in/Right-out in site “Build” scenarios)
- Sawmill Parkway/Seldom Seen Road
- Seldom Seen Road/Bunker Lane
- Seldom Seen Road/Liberty Road
- Site Access to Sawmill Parkway (proposed full movement signalized intersection including future west leg)

A schematic representation of existing study area conditions has been documented in **Figure 2** and described below in further detail.

Sawmill Parkway is a four-lane, north/south Major Arterial roadway with a posted speed limit of 45 miles per hour. Seldom Seen Road is a Minor Collector roadway providing three lanes with a speed limit of 45 miles per hour in the vicinity of the Sawmill Parkway intersection. The speed limit on Seldom Seen Road transitions to 35 mph east of the CSX railroad tracks at the east edge of the site. Liberty Road is a two-lane, Minor Arterial roadway with a posted speed limit of 35 miles per hour. Seldom Seen Road intersects Liberty Road under stop control. Sawmill Parkway intersects Seldom Seen Road under traffic signal control.

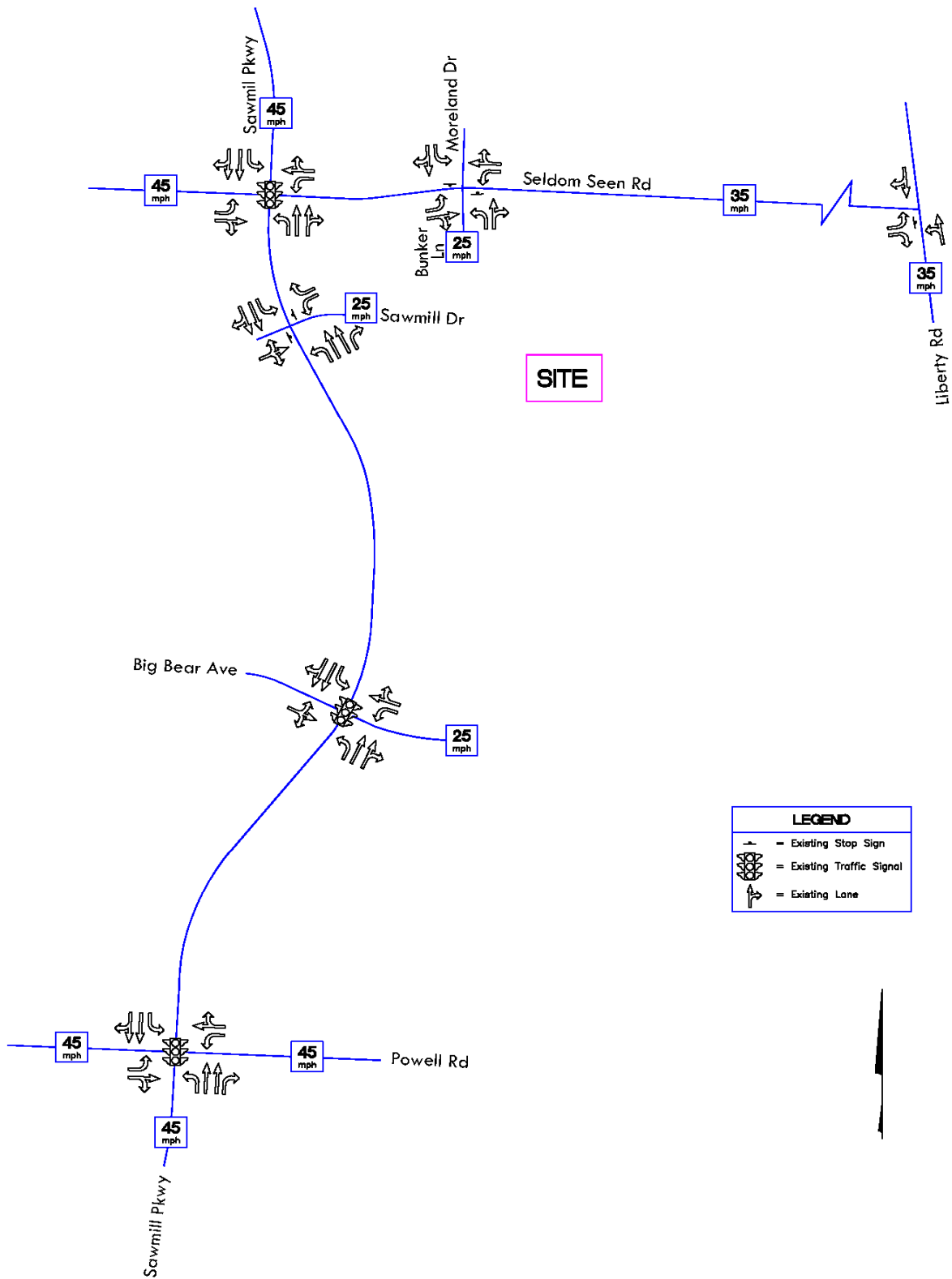
4.0 DATA COLLECTION

Manual turning movement counts were previously conducted by EMH&T personnel at the following intersections on November 7th and 8th, 2012, from 7 AM to 9 AM and 4 PM to 6 PM:

- Sawmill Parkway/Powell Road (SR 750)
- Sawmill Parkway/Big Bear Avenue
- Sawmill Parkway/Sawmill Drive
- Sawmill Parkway/Seldom Seen Road
- Seldom Seen Road/Bunker Lane

All counts were conducted on weekdays to represent average conditions, including the Seldom Seen Road/Liberty Road intersection on November 13, 2012 from 7 AM to 6 PM. An additional count was performed there December 13, 2012 from 6 PM to 8 PM to gather added hours of data. Traffic count data used in this study are included for reference in **Appendix A**.

FIGURE 2: Existing Study Area Conditions



5.0 TRAFFIC VOLUME PROJECTIONS

The impact of the Powell Grand development on the adjacent street network was determined by combining estimated site-generated trips with background traffic volumes and analyzing the street system under full build conditions. Traffic volumes were projected for the weekday morning and afternoon peak hour based on the development plan shown in **Exhibit 1**. Detailed traffic volume calculations have been included in **Appendix B** and are discussed in Section 5.1 below.

The proposed Powell Grand development represents a substantial decrease in the traffic generating potential of this property. This site is currently zoned for high density retail development that would generate traffic five times what is currently being proposed for the site. Trip generation potential for the current zoning on this site was estimated using ITE's Land Use Code 820 (Shopping Center) for a 400,000 S.F. retail center, resulting in 1,517 afternoon peak hour trip ends, which is illustrated in **Table 1** below:

TABLE 1: Existing Zoning Trip Generation Results

Time Period	Trip Type	Entering	Exiting	Total
ADT	Total	8,361	8,361	16,722
AM Peak Hour	Primary	200	122	322
	Pass-By	31	31	62
	Total	231	153	384
PM Peak Hour	Primary	539	584	1,123
	Pass-By	197	197	394
	Total	736	781	1,517

A background traffic growth rate was requested from the Mid-Ohio Regional Planning Commission (MORPC) and was submitted to the County Engineer for review and approval on January 10, 2013. The recommended growth rates for the study area provided by MORPC are:

- Sawmill Parkway- 3%
- Powell Road- 2%
- Seldom Seen Road- 2.5%
- Liberty Road- 3%

Opening day and design year, morning and afternoon peak hour traffic volumes were projected for a single build scenario that includes all proposed access with full development of the site. Opening Year for this study is 2016 and the Design Year is 2036. Traffic data was developed for the following scenarios:

- 2016 Background (site “no-build” condition, includes ‘other development traffic’)
- 2016 Full Build of Site with Proposed Access and warranted roadway improvements
- 2036 Background (site “no-build” condition, includes ‘other development traffic’)
- 2036 Full Build of Site with Proposed Access and warranted roadway improvements

5.1 Site Traffic Volumes

Morning and afternoon weekday peak hour site generated trip ends for the proposed development were forecast using trip generation rates for land use code #251 (Senior Adult Housing, Detached) and #710 (Office) as published in Trip Generation, 9th Edition (Institute of

Transportation Engineers, 2012). Trip generation for the residential component was based on the ‘detached’ senior housing rates since the exact mix of housing type that will be build it undetermined and the detached rate is more conservative than the attached senior living rate. Site generated trip ends were distributed to the adjacent street network according to patterns observed in the manual traffic count procedure and based on engineering judgment regarding likely origins and destinations of trips during peak hours.

Site generated trips were added to background traffic to determine full build traffic volumes. All site traffic was viewed as primary trip ends so no pass-by traffic was calculated for these land uses. **Table 2** below illustrates the expected trip generation for the Powell Grand site. Additionally, a planned daycare at the Sawmill Drive intersection with Sawmill Parkway was added as ‘other development’ traffic to the background condition. Detailed trip generation data for the site as well as other development (daycare and 5-acre office site) is included in **Appendix B** for reference. The proposed site is expected to generate 238 PM Peak trip ends while the current zoning for the site would permit high density retail that could generate up to 1,517 trip ends in the same PM Peak hour.

TABLE 2: Expected Trip Generation – Powell Grand Site

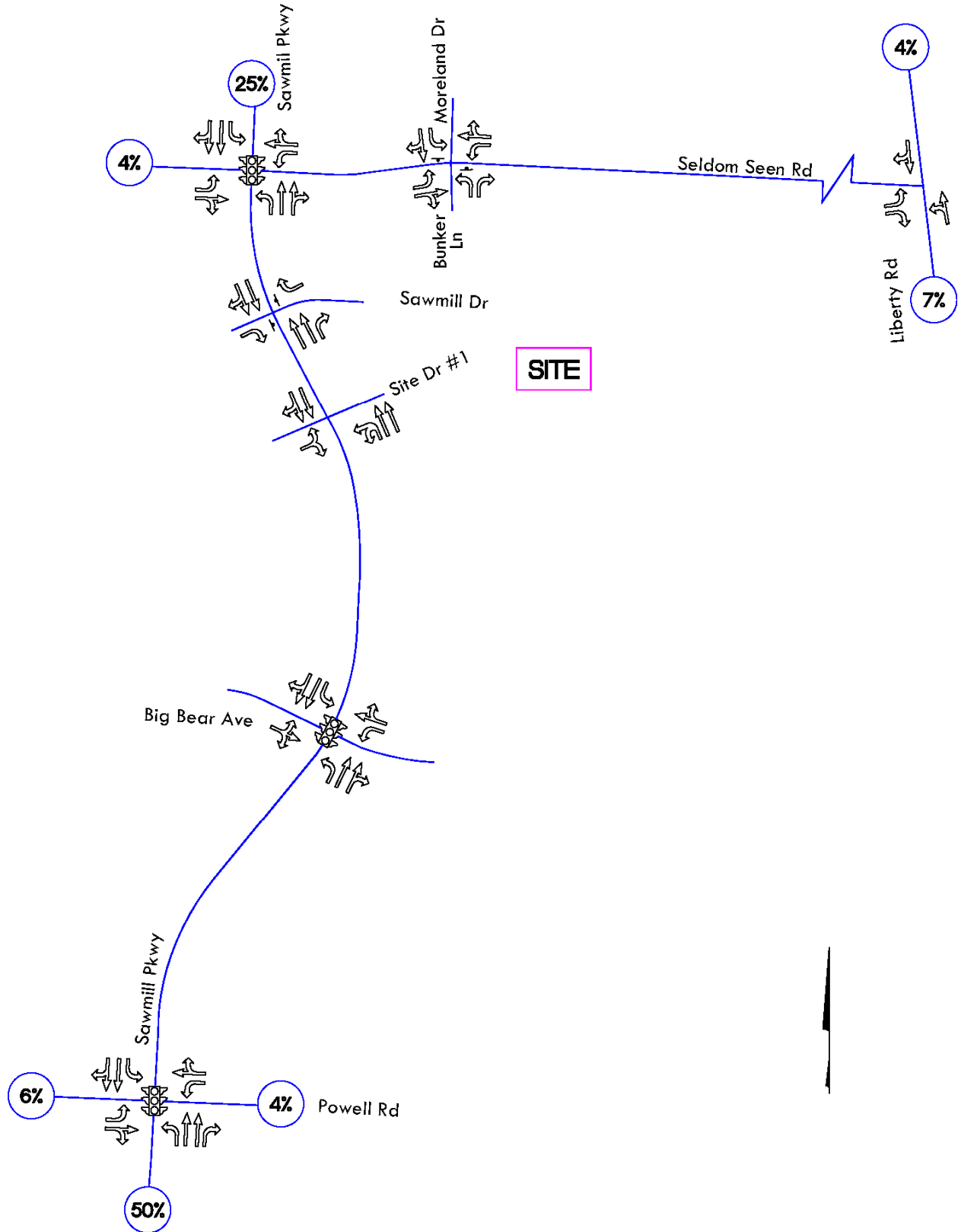
Land Use	Square Feet or Units	ITE Code	Time Period	ITE Formula	Total Trips	Trips Entering	Trips Exiting
Senior Adult Housing (Detached) (Use for Condo Communities)	308 units	251	ADT	$\ln(T)=0.89\ln(x)+2.06$	1,288	644	644
			AM Peak	$T=0.17(x)+29.95$	82	29	53
			PM Peak	$\ln(T)=0.75\ln(x)+0.35$	104	63	41
Office	50,000 sf	710	ADT	$\ln(T)=0.76\ln(x)+3.68$	776	388	388
			AM Peak	$\ln(T)=0.80\ln(x)+1.57$	110	97	13
			PM Peak	$T=1.12(x)+78.45$	134	23	111
Total			ADT		2,064	1,032	1,032
			AM Peak		192	126	66
			PM Peak		238	86	152

Trip distribution assumptions are based on the traffic count data, travel patterns in the study area and input from the Delaware County Engineers Office. The expected gateway distributions are listed below and included on the attached **Figure 3**:

- From/to Sawmill Parkway north – 25%
- From/to Sawmill Parkway south – 50%
- From/to Seldom Seen Road west – 4%
- From/to Liberty Road north – 4%
- From/to Liberty Road south – 7%
- From/to Powell Road east – 4%
- From/to Powell Road west – 6%

Proposed trip distribution and trip assignments were previously approved by the County Engineer under a prior traffic study and were re-approved on May 7, 2015, with the current Memorandum of Understanding. Global trip distribution percentages are illustrated on **Figure 3** and detailed trip assignments for site traffic are included in **Appendix B** for reference.

FIGURE 3: Global Trip Distribution



5.2 2016 No Build Traffic Volumes

Opening day 2016 background traffic volumes were derived by expanding counted traffic volumes with the MORPC recommended annual growth rate applied to Sawmill Parkway (3%), Seldom Seen Road (2.5%), Liberty Road (3%) and Powell Road (2%). Opening year 2016 peak hour traffic is illustrated on **Figures 4** and **5**. Detailed traffic volume assignments are provided for reference in **Appendix B**.

5.3 2016 Build Traffic Volumes (Full Build of Site with Proposed Access)

Traffic volumes developed per section 5.2 above were used as No Build Conditions and site generated trips for Powell Grand were added. Opening year 2016 Build peak hour traffic is illustrated on **Figures 4** and **5** and detailed traffic volume assignments are included for reference in **Appendix B**.

5.4 2036 No Build Traffic Volumes

Design year 2036 background traffic volumes were derived by expanding counted traffic volumes with the MORPC recommended annual growth rate applied to Sawmill Parkway (3%), Seldom Seen Road (2.5%), Liberty Road (3%) and Powell Road (2%). Projected design year 2036 peak hour traffic is illustrated on **Figures 6** and **7**. Detailed traffic volume assignments are provided in **Appendix B**. Comparing 2036 background volumes to 2016 background volumes indicates that MORPC estimates predict traffic volumes on Sawmill Parkway will grow by around 75% irrespective of site development. Two-way volumes passing by the site during the afternoon peak hour are projected to increase by over 2000 vehicles per hour according to the MORPC model which reflects an extension of Sawmill Parkway northwest to US 42.

5.5 2036 Build Traffic Volumes (Full Build of Site with Proposed Access)

Site generated traffic was added to 2036 background traffic volumes to determine 2036 Build volumes. Projected design year 2036 peak hour traffic is illustrated on **Figures 6** and **7**. Detailed traffic volume assignments are provided for reference in **Appendix B**.

FIGURE 4: 2016 Traffic Volumes - AM Peak Hour

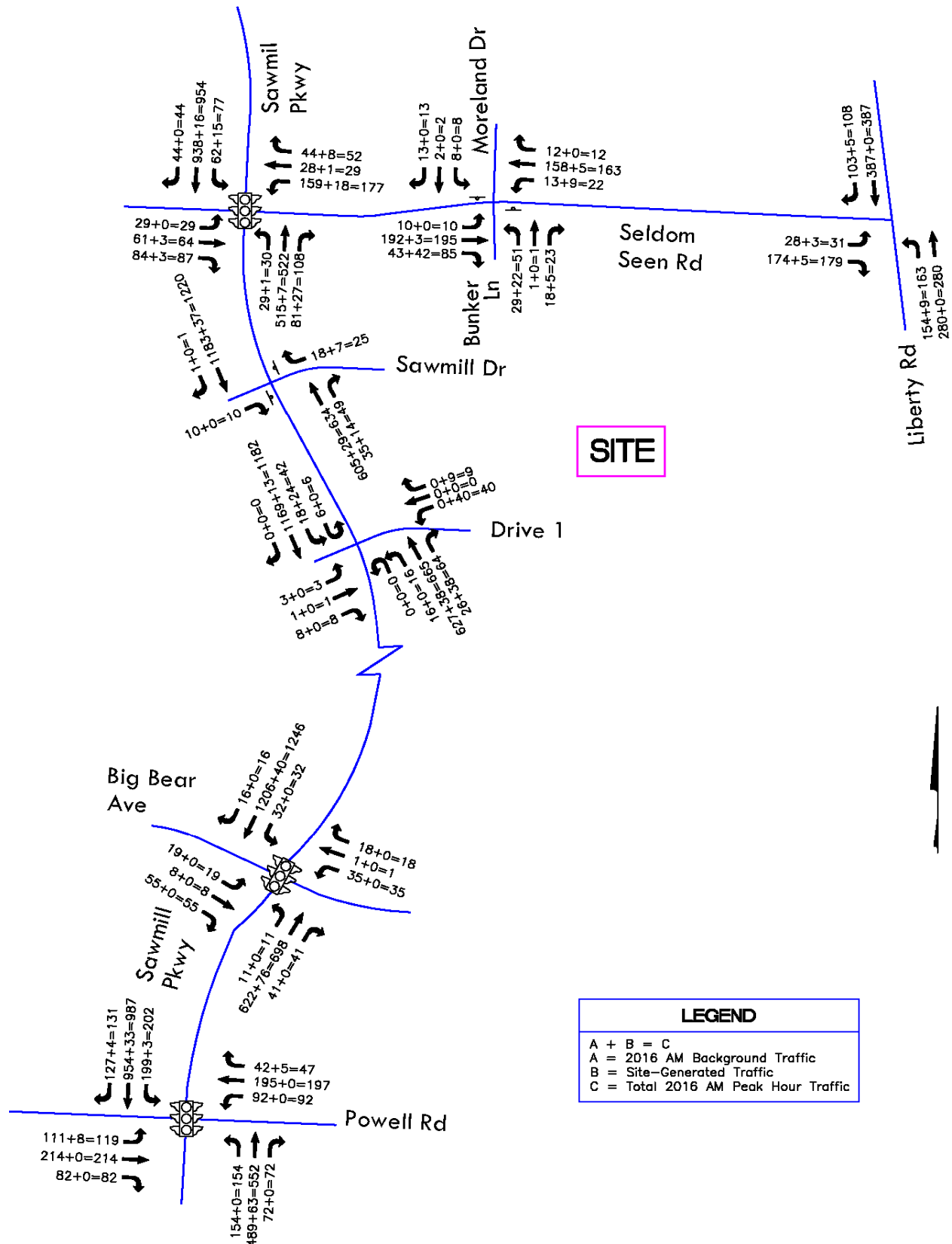


FIGURE 5: 2016 Traffic Volumes - PM Peak Hour

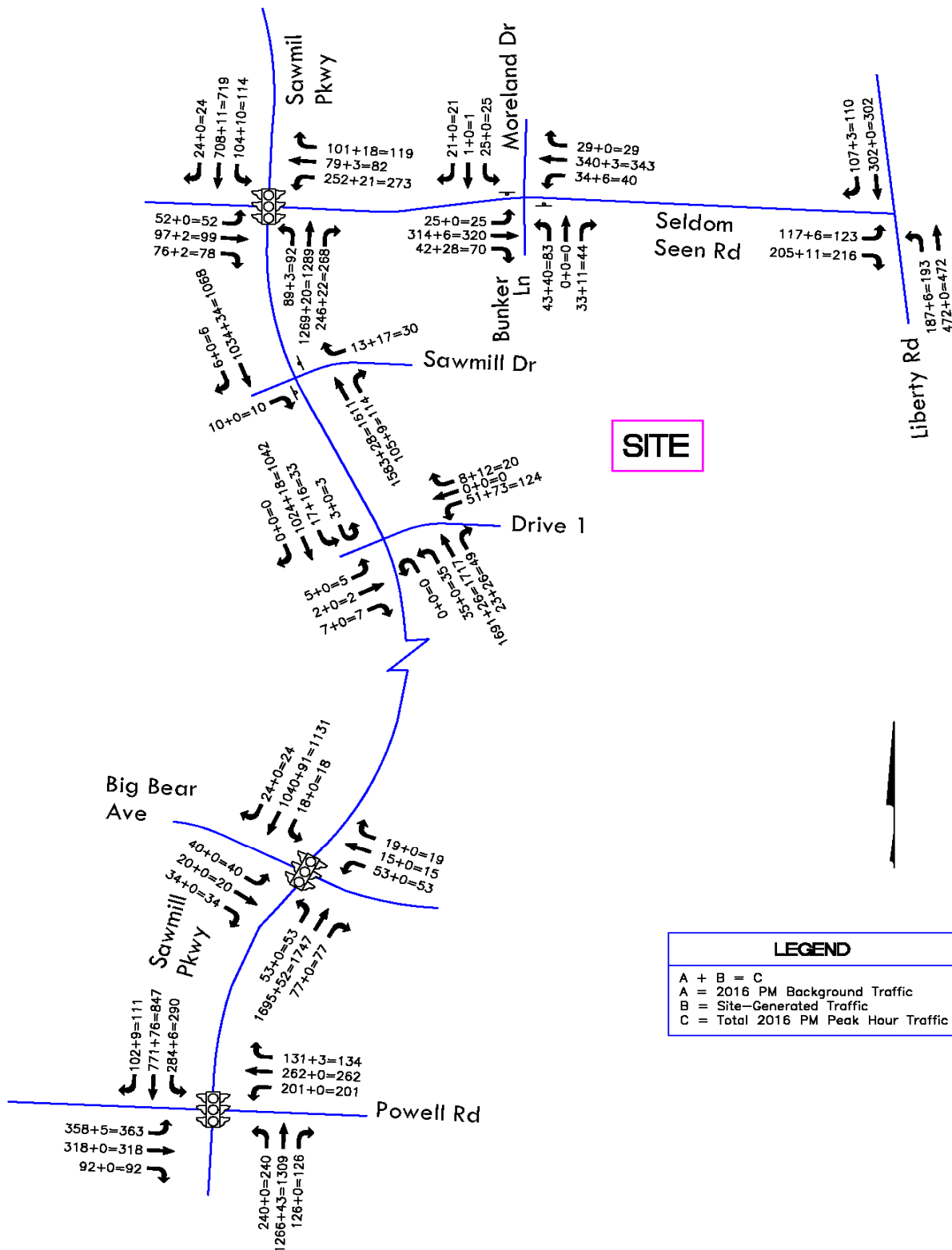


FIGURE 6: 2036 Traffic Volumes - AM Peak Hour

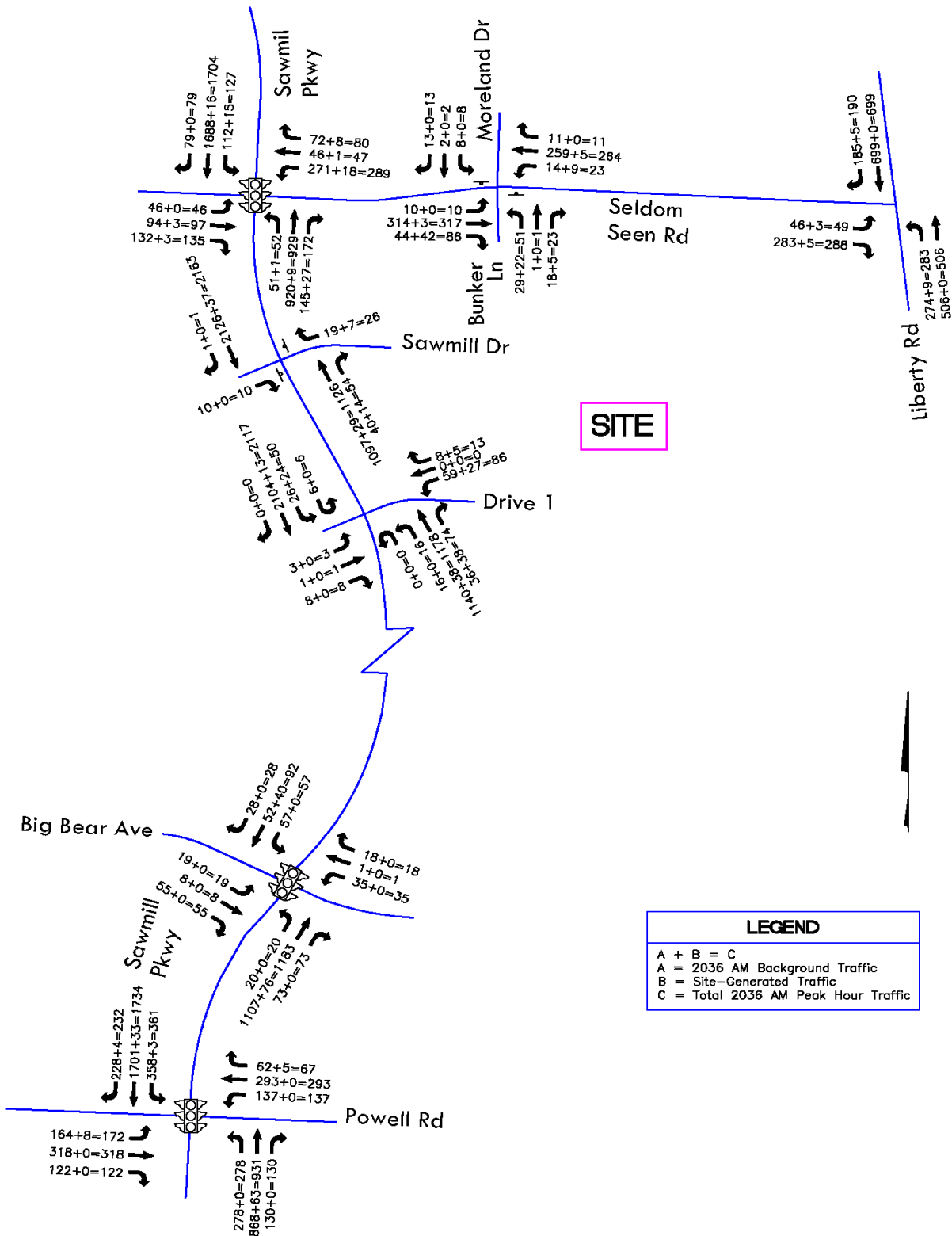
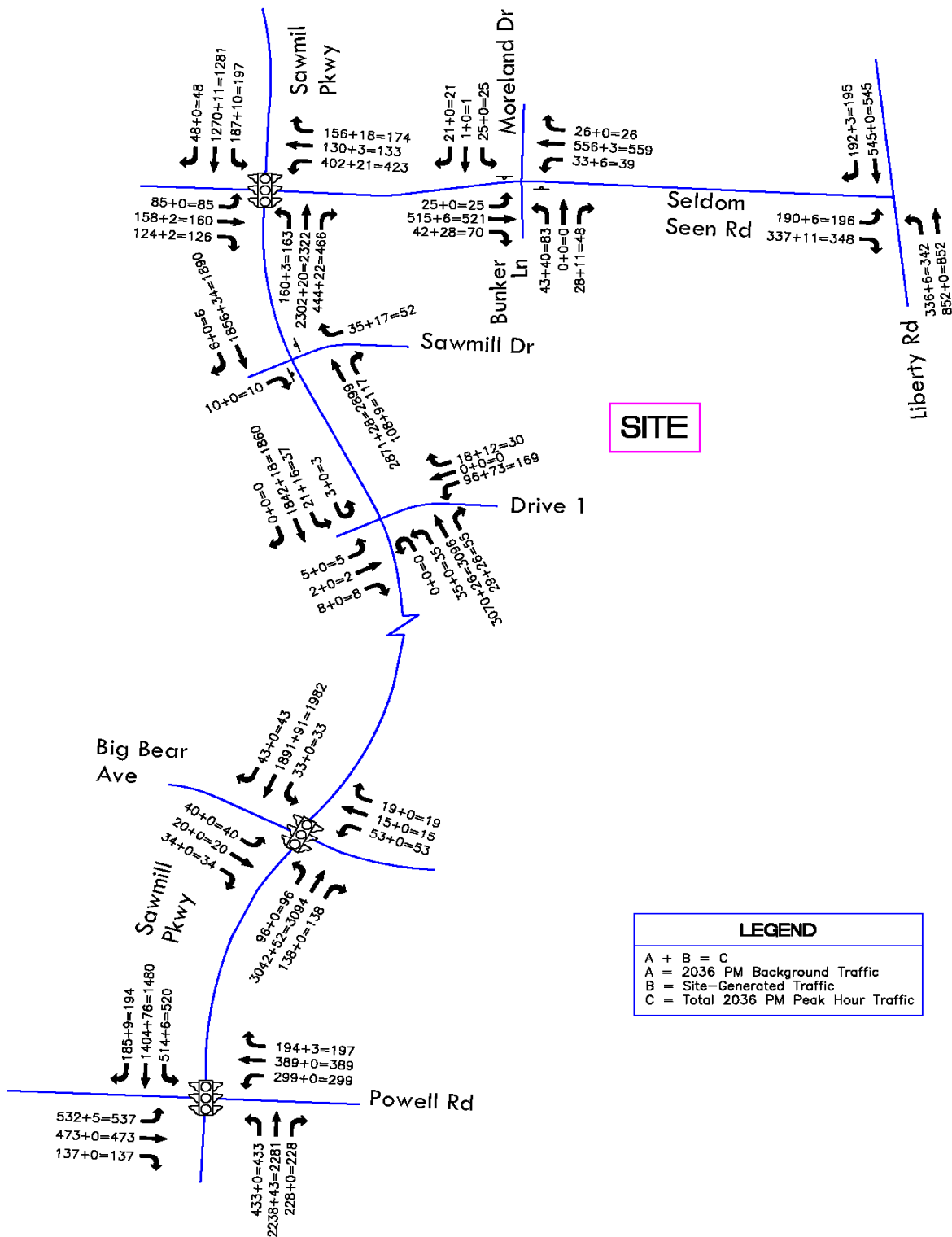


FIGURE 7: 2036 Traffic Volumes - PM Peak Hour



6.0 TRAFFIC ANALYSES

Weekday morning and afternoon peak hour traffic for each scenario was used to analyze the existing/future street network and proposed access plan. Analyses and results are detailed in the following sections and include traffic signal warrants, turn lane warrants, turn lane length calculations and intersection capacity analyses. Delaware County Engineer personnel provided local and system timing for the Sawmill Parkway signal system which includes all the study area intersections in that system. Considering the priority on coordinating north/south through movement in the Sawmill Parkway corridor, approach delays were not necessarily balanced in the analyses. Results of those analyses are provided in the following sections.

Opening Day conditions at the Sawmill Parkway/Powell Road intersection account for an Ohio Department of Transportation (ODOT) project to widen Powell Road to two through lanes in each direction, add right turn lanes on the southbound and eastbound approaches, and create dual left turn lanes on the northbound, southbound and eastbound approaches. This is a more significant improvement than discussed in the past and ODOT District 6 staff indicated the planned improvements are scheduled to be awarded for construction in mid-2015.

6.1 Traffic Signal Warrants

Traffic signal warrants were assessed using thresholds established by the Ohio Manual of Uniform Traffic Control Devices § 4C (Ohio Department of Transportation, 2012) (OMUTCD). At the Seldom Seen Road/Liberty Road intersection, fourteen hour count data was compared to volume criteria specified in Warrant 1 (Eight-Hour Warrant) as well as Warrant 2 (Four-Hour Warrant). The intersection satisfies warrant criteria for signalization regardless of site development in 2016.

At the Site Drive 1/Sawmill Parkway intersection, volume projections for the intersection indicate a traffic signal is warranted by 2036 Build conditions as a two-lane, side street approach. However, the Site Drive 1 intersection will meet warrants in the 2016 Build condition if just the Drive 1 left turn volume is compared to the single lane approach criteria. For that reason, the signal is expected to be warranted in the 2016 Build condition. At the Bunker Drive/Seldom Seen Road intersection, a traffic signal is not predicted to be warranted under future No Build or Build conditions, as estimated by the projected eighth-high hour volumes expected there. The signal warrant worksheets for each location are provided for reference in **Appendix C. Table 3** below illustrates the results of the warrant analyses.

TABLE 3: Signal Warrant Analysis Results

Intersection	Warrant 1 Eight-Hour	Warrant 2 Four-Hour
Seldom Seen Road/Liberty Road (Background)	YES (2016)	YES (2016)
Sawmill Pkwy/Drive 1 (Build)	YES (2016)	N/A
Seldom Seen Rd/Bunker Dr (Build)	NO (2036)	NO (2036)

6.2 Turn Lane Warrants

Left and right turn lane warrants were evaluated at Seldom Seen Road/Bunker pursuant to the requirements set forth in the Delaware County Traffic Impact Study Standards. An eastbound right turn lane is warranted on Seldom Seen Road at Bunker Lane and a northbound right turn lane is warranted on Sawmill Parkway at Drive 1 as site-related improvements in 2016. Turn lane warrant charts are provided for reference in **Appendix D**.

6.3 Turn Lane Length Calculations

Turn lane lengths were calculated for recommended turn lanes based on procedures outlined in the Location and Design Manual, Volume 1 (Ohio Department of Transportation, 2012). Results were used to size warranted turn lanes at the planned site driveways and at all needed turn lanes due to capacity. Turn lane length results are illustrated on **Figure 8** and **Figure 9**. Detailed lane-sizing calculations are provided in **Appendix D**. It should be noted that the existing northbound right turn lane at Sawmill Parkway/Sawmill Drive intersection is approximately 250 feet (deceleration taper included) and the required length is 250 feet in year 2036 due to addition of site traffic. Therefore, it is not necessary to make improvements to this turn lane.

6.4 Intersection Capacity Analyses

Synchro v.8 was used to evaluate operational characteristics of study area intersections. The analytical focus of the study was on investigating intersection capacity at the locations listed above. Capacity analyses used Synchro software to identify any degradation of intersection operations due to the addition of site generated traffic. The County Engineer provided current timings and operational data for the Sawmill Parkway signal system. This data was used for our capacity analyses, and updated volumes and intersection geometry were used as needed to reflect the analysis scenarios described above.

Levels of Service (LOS) are expressed in terms of letter grades with LOS A representing the highest quality traffic flow and minimal delay, and LOS F representing poor traffic operations and significant delay. Synchro analyses have been summarized for each intersection in **Table 4** and **Table 5**, including both morning and afternoon peak hours. The discussion below focuses on the PM Peak Hour results as that hour presents higher traffic volumes overall and controls the results. Detailed capacity analysis reports for 2016 conditions are provided in **Appendix E**. Detailed capacity analysis reports for 2036 conditions are provided in **Appendix F**.

6.4.1 Year 2016 No Build Conditions

The signalized intersection of Sawmill Parkway/Powell Road will be improved by ODOT starting in 2015 and expected to be complete by 2016. Planned improvements there include dual left-turn lanes northbound, southbound and eastbound, an additional eastbound and westbound through lane on Powell Road, and right turn lanes added on the eastbound and southbound approaches to the intersection. These opening year 2016 improvements have been included as 'background' conditions for 2016 analyses. With these improvements, the intersection is predicted to operate at LOS D or better.

The Sawmill Parkway/Big Bear Avenue signalized intersection is expected to operate at acceptable levels of service (LOS D or better). The Sawmill Drive intersection with Sawmill Parkway is currently stop-controlled with all movements permitted. The eastbound and westbound approaches operate at a LOS F during the PM peak hour. The Sawmill Parkway/Seldom Seen Road signalized intersection is expected to operate at overall LOS D, just past the LOS C threshold.

The Seldom Seen Road/Bunker Lane/Moreland Drive intersection is expected to operate at acceptable levels of service (LOS C or better) in its existing configuration under side street stop control. The Seldom Seen Road/Liberty Road currently meets warrants for a traffic signal and a northbound left turn lane. With those improvements assumed in the No Build condition, the intersection is predicted to operate at acceptable level of service.

6.4.2 2016 Build Conditions

The Sawmill Parkway/Powell Road intersection under build conditions was analyzed with planned ODOT improvements, consistent with the background analysis discussed above. With these improvements, the build condition is also predicted to operate at overall acceptable LOS D for the intersection. Similarly, the signalized Sawmill Parkway/Big Bear Avenue intersection is expected to operate at acceptable levels similar to the background 2016 condition.

The Sawmill Drive intersection with Sawmill Parkway will be converted to right-in/right-out operation and operate at LOS C under Build conditions. The Villages at Sawmill Parkway will construct the right-in/right-out improvements on the east side of Sawmill Parkway as part of the site construction. Site improvements will also connect to a new traffic signal at the Site Drive 1 intersection with Sawmill Parkway, all in support of the County access management plan for this area. Timing of the right-in/right-out improvements and connection to the traffic signal on the west side of Sawmill Parkway is unknown as that side of the roadway is controlled by a different property owner. The Sawmill Parkway/Drive 1 intersection is predicted to operate at LOS A overall with a left turn only lane and a through/right lane to serve expected site traffic volumes.

The Sawmill Parkway/Seldom Seen Road signalized intersection improves slightly to LOS C in the Build condition with existing lane assignments and signal phasing.

The Seldom Seen Road/Bunker Lane/Moreland Drive intersection is expected to operate acceptably with side street left turn movements operating at LOS D or better. Seldom Seen Road at Liberty Road is expected to operate at LOS B under signal control and site “build” conditions.

6.4.3 Year 2036 No Build Conditions

The growth rates provided by MORPC produce more than a 75% increase in Sawmill Parkway traffic over 20 years. The resulting peak hour forecast of over 4,000 vehicles (total of both directions) on Sawmill Parkway is consistent with a daily, ADT volume of 40,000 to 45,000 vehicles. These traffic levels strongly suggest that an added third through lane will be required in each direction on Sawmill Parkway, irrespective of site development. Delaware County Traffic Impact Study Standards state on page 5 *“Improvements necessary to accommodate the non-site traffic in the design year at LOS C in non-urban areas or LOS D in urban areas shall be determined even though the developer may not be required to undertake these improvements”*. Previous

submittals of this study determined additional lanes required to accommodate non-site traffic in the design year of 2036. County comments instructed us to remove those background improvements and perform a strict “no-build” versus “build” comparison on the existing roadway configuration plus committed improvements such as the ODOT project at Sawmill Parkway/Powell Road.

Without further improvements, most Sawmill Parkway intersections in the study area are expected to operate at LOS F in the design year, irrespective of site development. This includes the Sawmill Parkway/Powell Road intersection which is expected to operate at LOS F in the design year even after accounting for the improvements to be built by ODOT starting in 2015. If the overall intersection is not at LOS F (Sawmill Parkway/Big Bear Avenue is at LOS C overall), individual movements or approaches are at LOS F in the Sawmill Parkway corridor.

Seldom Seen Road intersections east of Sawmill Parkway were found to operate more acceptably in the design year background condition with the Bunker Lane/Moreland Drive intersection at LOS E or better and the Seldom Seen Road/Liberty Road intersection at LOS C with warranted turn lane and signal improvements discussed earlier in this report. Full reporting of “no-build” levels of service in the design year have been provided in **Table 5**.

6.4.4 2036 Build Conditions

In accordance with County comments, our “build” analysis returns intersection level of service to “no-build” levels or better. In the Sawmill Parkway corridor, that was achieved by 1) adding a westbound protected/permitted left turn phase at the Sawmill Parkway/Seldom Seen Road intersection and 2) adding an eastbound left turn lane on Big Bear Avenue at Sawmill Parkway by restriping existing pavement. The signalized Drive 1 intersection attained overall LOS D in the 2036 design year but some movements operate poorly, again due to the lack of through lane capacity on Sawmill Parkway. The right-in/right-out operation at Sawmill Parkway/Sawmill Drive is predicted to operate significantly better than in its current condition as a full movement, unsignalized intersection.

In the Seldom Seen Road corridor, the Bunker Lane/Moreland Drive intersection is predicted to operate acceptably overall but the sidestreet left turns are expected to operate poorly in the 2036 design year under stop sign control. As discussed above, this intersection is not predicted to meet signal warrants by the 2036 design year but alternate access is available including the proposed signalized intersection of Sawmill Parkway/Drive 1. The Seldom Seen Road/Liberty Road intersection maintains the No Build level of service for the intersection, but like the no-build condition, would benefit from area-wide through lane capacity along Sawmill Parkway. Please refer to **Table 5** for a detailed summary of results.

TABLE 4: 2016 AM/PM Peak Capacity Analysis Results

Time Period	Scenario	EBLT	EBTH	EBRT	APPROACH	WBLT	WBTH	WBRT	APPROACH	NBLT	NBTH	NBRT	APPROACH	SLBT	SBTH	SBRT	APPROACH	TOTAL
Sawmill Pkwy & Powell Rd																		
AM Peak Hour	No Build	D/46.7/0.51	D/41.3/0.50	C/33.8/0.27	D/41.3	C/34.9/0.36	D/42.4/0.54	D/42.8/0.55	D/40.5	D/48.1/0.64	A/9.2/0.29	A/6.9/0.09	B/17.4	A/9.7/0.19	B/12.0/0.57	A/7.6/0.16	B/11.2	C/20.8
	Build	D/47.5/0.54	D/41.3/0.50	C/33.8/0.27	D/41.6	C/34.9/0.36	D/42.7/0.55	D/43.2/0.57	D/40.7	D/48.1/0.64	A/9.5/0.33	A/6.9/0.09	B/16.9	A/9.8/0.21	B/12.3/0.59	A/7.6/0.16	B/11.4	C/20.8
PM Peak Hour	No Build	E/63.7/0.84	D/49.6/0.62	D/35.8/0.24	D/54.5	D/39.8/0.62	E/66.8/0.82	E/72.1/0.84	E/59.4	E/58.1/0.75	D/40.7/0.90	B/14.5/0.16	D/41.3	E/64.8/0.81	C/26.1/0.53	B/13.2/0.12	C/34.5	D/44.4
	Build	E/74.4/0.91	D/49.2/0.62	D/35.6/0.24	E/59.4	D/41.7/0.65	E/66.6/0.81	E/71.9/0.84	E/60.0	E/58.1/0.75	D/39.4/0.90	B/14.1/0.16	D/40.2	E/78.2/0.90	C/26.5/0.58	B/13.4/0.13	D/37.4	D/45.6
Sawmill Pkwy & Big Bear Ave																		
AM Peak Hour	No Build		D/47.3/0.52		D/47.3	D/44.4/0.22		D/43.7/0.17	D/44.1	A/0.1/0.03	A/0.4/0.24	A/0.4/0.24	A/0.4	A/0.1/0.05	A/1.0/0.45	A/1.0/0.45	A/1.0	A/3.7
	Build		D/47.3/0.52		D/47.3	D/44.4/0.22		D/43.7/0.17	D/44.1	A/0.1/0.03	A/0.5/0.27	A/0.5/0.27	A/0.5	A/0.2/0.05	A/1.1/0.46	A/1.0/0.46	A/1.0	A/3.6
PM Peak Hour	No Build		E/56.9/0.59		E/56.9	D/54.0/0.36		D/51.7/0.25	D/53.1	A/2.8/0.12	A/6.3/0.64	A/6.4/0.65	A/6.3	A/4.4/0.09	A/0.8/0.39	A/0.7/0.39	A/0.8	A/7.2
	Build		E/56.9/0.59		E/56.9	D/54.0/0.36		D/51.7/0.25	D/53.1	A/2.9/0.13	A/6.7/0.66	A/6.8/0.67	A/6.6	A/5.0/0.10	A/0.9/0.42	A/0.9/0.42	A/0.9	A/7.3
Sawmill Pkwy & Sawmill Dr																		
AM Peak Hour	No Build	D/25.9/0.121	D/25.9/0.121	D/25.9/0.121	D/25.9	F/89.5/0.625	B/10.6/0.04	B/10.6/0.04	F/65.4	B/11.8/0.031	N/A	N/A	0.3	A/9.0/0.028	N/A	N/A	0.2	N/A
	Build	N/A	N/A	B/14.2/0.027	B/14.2	N/A	N/A	B/10.8/0.041	B/10.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PM Peak Hour	No Build	F/99.4/0.416	F/99.4/0.416	F/99.4/0.416	F/99.4	F/1710/3.656	C/18.1/0.102	C/18.1/0.102	F/1097	B/11.1/0.06	N/A	N/A	0.2	C/15.3/0.058	N/A	N/A	0.3	N/A
	Build	N/A	N/A	B/13.2/0.024	B/13.2	N/A	N/A	C/19.1/0.135	C/19.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sawmill Pkwy & Drive 1																		
AM Peak Hour	No Build																	
	Build		D/42.4/0.02		D/42.2	D/46.9/0.48		D/42.2/0.09	D/46.4	A/2.4/0.04	A/3.3/0.28	A/3.2/0.28	A/3.2	A/0.5/0.08		A/1.0/0.44	A/1.0	A/4.1
PM Peak Hour	No Build																	
	Build		D/48.4/0.02		D/47.6	E/56.6/0.62		D/47.8/0.12	E/55.3	A/3.4/0.08	A/8.5/0.67	A/8.5/0.67	A/8.4	A/7.7/0.19		A/0.8/0.39	A/1.0	A/8.2
Sawmill Pkwy & Seldom Seen Rd																		
AM Peak Hour	No Build	D/36.5/0.11		D/49.9/0.76	D/47.6	D/35.5/0.59		D/35.1/0.24	D/35.3	B/10.3/0.09	A/8.7/0.34	A/8.8/0.34	A/8.8	A/9.5/0.13	B/10.2/0.54	B/10.2/0.54	B/10.2	B/15.7
	Build	D/36.1/0.1		D/50.6/0.76	D/48.3	D/37.6/0.65		D/35.0/0.27	D/36.8	B/10.7/0.09	A/9.4/0.36	A/9.5/0.37	A/9.5	A/9.9/0.17	B/10.7/0.55	B/10.7/0.55	B/10.6	B/16.5
PM Peak Hour	No Build	D/42.8/0.2		E/71.9/0.83	E/65.1	E/55.9/0.84		D/43.0/0.51	D/50.5	B/13.1/0.23	C/35.0/0.86	D/37.3/0.89	C/34.9	C/31.8/0.61	B/17.8/0.41	B/17.8/0.41	B/19.5	D/35.1
	Build	D/42.3/0.21		E/72.8/0.83	E/65.8	E/59.5/0.87		D/43.7/0.56	D/52.8	D/13.2/0.25	B/13.9/0.90	B/17.1/0.93	B/15.4	B/12.9/0.41	B/18.7/0.42	B/18.7/0.42	B/17.9	C/25.1
Bunker Ln & Seldom Seen Rd																		
AM Peak Hour	No Build	A/7.6/0.008	N/A	N/A	0.3	A/7.8/0.011	N/A	N/A	0.6	B/12.8/0.063	A/9.7/0.026	A/9.7/0.026	B/11.6	B/12.5/0.018	A/9.7/0.021	A/9.7/0.021	B/10.7	N/A
	Build	A/7.6/0.008	N/A	N/A	0.3	A/7.9/0.019	N/A	N/A	0.9	B/14.0/0.121	A/9.9/0.034	A/9.9/0.034	B/12.7	B/13.3/0.019	A/9.8/0.021	A/9.8/0.021	B/11.0	N/A
PM Peak Hour	No Build	A/8.2/0.186	N/A	N/A	0.5	A/8.1/0.031	N/A	N/A	0.7	C/22.8/0.186	B/10.5/0.052	B/10.5/0.052	C/17.5	C/21.7/0.111	B/11.0/0.038	B/11.0/0.038	C/16.7	N/A
	Build	A/8.2/0.023	N/A	N/A	0.5	A/8.3/0.038	N/A	N/A	0.8	D/29.7/0.383	B/10.8/0.071	B/10.8/0.071	C/23.2	C/23.6/0.122	B/11.1/0.038	B/11.1/0.038	C/17.7	N/A
Liberty Rd & Seldom Seen Rd																		
AM Peak Hour	No Build	C/28.4/0.12	N/A	D/38.0/0.81	D/36.7		N/A		N/A	A/10.0/0.28	A/4.6/0.23	N/A	A/6.5	N/A		A/6.1/0.43	A/6.1	B/11.7
	Build	C/28.3/0.12	N/A	D/38.0/0.81	D/36.6		N/A		N/A	B/10.5/0.30	A/4.7/0.23	N/A	A/6.8	N/A		A/6.2/0.43	A/6.2	B/12.0
PM Peak Hour	No Build	B/16.7/0.37	N/A	C/20.4/0.72	B/19.1		N/A		N/A	B/11.2/0.38	A/6.9/0.50	N/A	A/8.1	N/A		A/6.7/0.46	A/6.7	B/10.2
	Build	B/17.0/0.37	N/A	C/21.0/0.73	B/19.6		N/A		N/A	B/11.7/0.40	A/7.1/0.50	N/A	A/8.4	N/A		A/6.9/0.46	A/6.9	B/10.6

X/X/X = Overall LOS / Average Delay Per Vehicle/Volume to Capacity Ratio

N/A = Not Applicable, movement does not exist

TABLE 5: 2036 AM/PM Peak Capacity Analysis Results

Time Period	Scenario	EBLT	EBTH	EBRT	APPROACH	WBTL	WBTH	WBRT	APPROACH	NBLT	NBTH	NBRT	APPROACH	SBLT	SBTH	SBRT	APPROACH	TOTAL
Sawmill Pkwy & Powell Rd																		
AM Peak Hour	No Build	E/56.3/0.73	D/39.4/0.58	C/31.5/0.34	D/42.4	C/34.6/0.55	D/41.2/0.64	D/41.7/0.65	D/39.6	F/123.8/1.09	B/15.5/0.58	B/10.2/0.18	D/38.5	B/13.8/0.51	F/74.9/1.10	B/10.7/0.30	E/58.9	D/49.1
	Build	E/59.6/0.77	D/39.3/0.58	C/31.4/0.33	D/43.4	C/34.4/0.54	D/41.2/0.64	D/41.6/0.66	D/39.5	F/123.8/1.09	B/16.3/0.62	B/10.3/0.18	D/38.0	B/14.7/0.54	F/85.1/1.13	B/10.8/0.30	E/66.8	D/52.9
PM Peak Hour	No Build	F/307.0/1.53	E/79.5/0.96	D/35.2/0.34	F/180.2	F/211.0/1.32	F/199.7/1.27	F/208.5/1.29	F/206.4	F/120.1/1.08	F/250.7/1.48	B/15.2/0.28	F/213.1	F/333.2/1.59	D/46.8/0.96	B/15.6/0.23	F/114.1	F/177.4
	Build	F/312.9/1.55	E/79.5/0.96	D/36.1/0.35	F/183.5	F/211.0/1.32	F/202.4/1.28	F/211.2/1.29	F/208.2	F/149.5/1.16	F/263.1/1.51	B/15.2/0.28	F/227.5	F/340.8/1.61	D/52.7/0.99	B/15.2/0.24	F/117.7	F/184.7
Sawmill Pkwy & Big Bear Ave																		
AM Peak Hour	No Build		D/47.3/0.52		D/47.3	D/44.4/0.22	D/43.7/0.17		D/44.1	A/1.2/0.11	A/1.0/0.43	A/0.9/0.44	A/0.9	A/0.7/0.14	A/4.6/0.80	A/4.5/0.80	A/4.5	A/4.9
	Build		D/47.3/0.52		D/47.3	D/44.4/0.22	D/43.7/0.17		D/44.1	A/1.2/0.12	A/1.1/0.46	A/1.0/0.46	A/1.1	A/0.8/0.15	A/5.0/0.81	A/4.9/0.81	A/4.9	A/5.1
PM Peak Hour	No Build		F/93.7/0.83		F/93.7	E/57.5/0.43	E/55.3/0.33		E/56.6	A/9.5/0.45	F/72.4/1.12	F/79.0/1.14	E/73.8	F/85.8/0.58	A/2.5/0.68	A/2.5/0.69	A/3.9	D/48.6
	Build		F/93.7/0.83		F/93.7	E/57.5/0.43	E/55.3/0.33		E/56.6	B/11.3/0.49	F/79.8/1.14	F/86.5/1.15	F/81.2	F/85.8/0.58	A/2.9/0.71	A/2.9/0.72	A/4.2	D/52.6
Sawmill Pkwy & Sawmill Dr																		
AM Peak Hour	No Build	D/25.1/0.06	D/25.1/0.06	D/25.1/0.06	D/25.1	B/13.4/0.05	B/13.4/0.05	B/13.4/0.05	B/13.4	A/0			0	A/0			0	
	Build			D/25.7/0.6	D/25.7			B/13.5/0.03	B/13.5	A/0			0	A/0			0	
PM Peak Hour	No Build	C/21.0/0.05	C/21.0/0.05	C/21.0/0.05	C/21.0	F/58.1/0.36	F/58.1/0.36	F/58.1/0.36	F/58.1	A/0			0	A/0			0	
	Build			C/21.4/0.05	C/21.4			F/77.9/0.55	F/77.9	A/0			0	A/0			0	
Sawmill Pkwy & Drive 1																		
AM Peak Hour	No Build	D/44.4/0.02	D/44.4/0.1	D/44.4/0.1	D/44.4	D/48.1/0.41	D/44.3/0.09	D/44.3/0.09	D/47.6	A/0.8/0.08	A/0.9/0.43	A/1.0/0.43	A/1.0	A/0.3/0.07	A/3.9/0.76	A/3.9/0.76	A/3.8	A/3.8
	Build	D/42.4/0.02	D/42.0/0.07		D/42.1	D/47.0/0.49	D/42.2/0.1		D/46.3	A/3.3/0.08	A/4.6/0.47	A/4.6/0.47	A/4.6	A/2.2/0.16	A/4.7/0.79		A/4.5	A/5.8
PM Peak Hour	No Build	D/50.5/0.03	D/49.6/0.07	D/49.6/0.07	D/49.9	E/56.3/0.56	D/50.0/0.13	D/50.0/0.13	E/55.3	A/4.2/0.16	F/83.9/1.14	F/85.0/1.14	F/83.5	E/65.8/0.38	A/2.6/0.68	A/2.6/0.68	A/3.3	D/53.6
	Build	D/50.9/0.03	D/49.1/0.07		D/49.7	F/107.1/0.95	D/50.2/0.2		F/98.6	A/1.5/0.16	F/83.1/1.18	A/0.1/0.05	F/80.8	F/93.9/0.67	A/2.8/0.69		A/4.5	D/54.0
Sawmill Pkwy & Seldom Seen Rd																		
AM Peak Hour	No Build	C/34.6/0.17	F/122.9/1.07		F/108.1	F/159.9/1.20	D/36.8/0.39		F/121.9	C/24.7/0.38	B/14.2/0.63	B/14.3/0.63	B/14.7	B/12.5/0.35	D/41.7/0.99	F/44.8/1.00	D/41.5	D/46.8
	Build	D/35.6/0.19	F/166.4/1.19		F/145.1	F/239.1/1.39	D/39.3/0.48		F/177.0	C/24.1/0.36	B/13.1/0.64	B/13.4/0.64	B/13.7	B/11.9/0.39	C/33.8/0.96	D/36.2/0.98	C/33.5	D/51.5
PM Peak Hour	No Build	D/52.5/0.61	F/259.1/1.40		F/211.4	F/373.5/1.70	F/81.5/0.94		F/252.0	C/22.1/0.64	F/220.5/1.48	F/257.0/1.56	F/227.3	F/231.3/1.35	C/26.9/0.74	C/26.8/0.74	D/52.3	F/181.2
	Build	E/55.5/0.68	F/141.9/1.12		F/122.1	F/662.2/2.34	F/100.2/1.01		F/426.0	C/23.6/0.65	F/230.7/1.50	F/269.1/1.59	F/237.9	F/251.4/1.4	C/27.3/0.74	C/27.2/0.75	E/56.3	F/205.3
Bunker Ln & Seldom Seen Rd																		
AM Peak Hour	No Build	A/7.9/0.008			0.2	A/8.1/0.013			0.4	C/16.7/0.09	B/10.7/0.03	B/10.7/0.03	B/14.3	C/16.1/0.03	B/10.7/0.03	B/10.7/0.03	B/12.6	
	Build	A/7.9/0.008			0.2	A/8.3/0.02			0.6	C/19.0/0.18	B/10.9/0.04	B/10.9/0.04	C/16.4	C/17.2/0.03	B/10.9/0.03	B/10.9/0.03	B/13.1	
PM Peak Hour	No Build	A/8.9/0.03			0.4	A/8.8/0.04			0.5	F/52.1/0.38	B/12.5/0.08	B/12.5/0.08	D/33.8	E/45.2/0.23	B/13.5/0.05	B/13.5/0.05	D/30.4	
	Build	A/8.9/0.03			0.4	A/9.0/0.04			0.6	F/106/0.79	B/12.9/0.10	B/12.9/0.10	F/71.9	F/51.3/0.26	B/13.7/0.05	B/13.7/0.05	D/33.7	
Liberty Rd & Seldom Seen Rd																		
AM Peak Hour	No Build	C/31.5/0.16	N/A	F/113.6/1.08	F/102.2	N/A			N/A	F/109.6/1.07	A/7.2/0.42	N/A	D/43.2	N/A	B/14.2/0.78	B/14.2	D/40.1	
	Build	C/31.6/0.16	N/A	F/120.5/1.10	F/107.8	N/A			N/A	F/125.8/1.12	A/7.2/0.42	N/A	D/49.7	N/A	B/14.4/0.78	B/14.4	D/43.8	
PM Peak Hour	No Build	C/34.8/0.57	N/A	F/131.2/1.14	F/96.4	N/A			N/A	F/88.3/1.03	B/12.2/0.74	N/A	C/33.7	N/A	B/10.6/0.67	B/10.6	D/40.2	
	Build	D/37.3/0.63	N/A	F/173.9/1.25	F/124.6	N/A			N/A	F/83.6/1.02	B/11.3/0.73	N/A	C/32.0	N/A	A/9.9/0.67	A/9.9	D/45.8	
X/X/X = Overall LOS / Average Delay Per Vehicle/Volume to Capacity Ratio																		
N/A = Not Applicable, movement does not exist																		

7.0 CONCLUSION AND RECOMMENDATIONS

The current Powell Grand land use plan is a much lower traffic generator than potential retail development that could be developed under existing zoning. The impact of the current land use plan does cause the need for some off-site improvements that are limited to planned site driveways immediately adjacent to the site. This plan is also an improvement over previous residential uses proposed for this site due to the smaller number of units and the focus on senior living patrons.

The Powell Grand development is predicted to generate 86 inbound trips and 152 outbound trips in the afternoon peak hour. These vehicle trips are distributed among three access points and four directions of travel on two public roadways providing access to the site. Because the site access and surrounding road system provides a high degree of flexibility for accessing the site, the impact to any one movement or intersection is attenuated. In general, the number of site generated trips added to most intersection movements such as a left turns, through or right turns throughout the study area ranges from the single digits to 76 vehicles in the peak hour. This is just over one vehicle per minute and significantly less than that at many locations.

Some intersections in the study area are already challenged with high traffic volumes, and the Mid-Ohio Regional Planning Commission forecasts high rates of traffic growth through 2036. The 3% compound annual growth rate provided by MORPC for Sawmill Parkway predicts an increase in traffic volumes exceeding 75% during the next 20 years, irrespective of site development. Sawmill Parkway traffic is estimated to exceed 40,000 vehicles per day by the design year implying a general demand for an additional through lane in each direction. This finding is unrelated to site development and is supported by our capacity analysis of background conditions where we found a need for a third northbound through lane at Powell Road and at Seldom Seen Road by 2036.

Site related impacts to be mitigated in conjunction with site development were determined for opening day conditions and illustrated in **Figure 8**. A graphical summary of the 2036 conditions we analyzed are illustrated in **Figure 9**.

7.1 Site Mitigation Improvements

Development of the Powell Grand site requires modification of the existing road system by the developer, as follows:

1. Signalize the proposed Drive 1 access to Sawmill Parkway and provide a minimum three lane east leg on the Powell Grand site consisting of separate left and right turn lanes outbound and one inbound lane. Installation of the traffic signal will require a maintenance agreement between the County and the developer. Outbound turn lanes should provide a minimum of 100 feet of storage and should be aligned so the right turn lane can be converted to a through-right lane in the future.
2. The northbound right turn lane on Sawmill Parkway at Site Drive 1 should be 175 feet to meet storage and deceleration requirements. “No Block” conditions caused by through lane traffic would require a longer lane but Park Woods Lane limits the length of the northbound right turn lane for Site Drive 1 to approximately 300 feet.
3. Open the median at the Drive 1 access point and provide a southbound left turn lane into Powell Grand and a northbound left turn lane that will be used to accommodate northbound U-Turns at the signal. Future improvements by others will establish an access on the west side of Sawmill Parkway that will also use the northbound left turn lane. The southbound left turn lane should be 225 feet long (including a 50 foot long drop taper) and the northbound left turn lane should be 175 feet based on storage and deceleration requirements. However, to help address “No Block” conditions caused by through lane traffic, these two turn lanes should be extended to the extent that space is available between Sawmill Drive and Park Woods Lane. With only two through lanes on Sawmill Parkway, the no block calculations yield a length of 1550’ for southbound through traffic and 1850’ for northbound through traffic which is not possible to provide.
4. Modify Sawmill Drive east of Sawmill Parkway to permit only right turn movements to and from Sawmill Parkway when Drive 1 signalization is completed. Remove the southbound left turn lane and enlarge the existing curbed median to replace the current left turn lane area there.
5. Retain Seldom Seen Road at Bunker Lane/Moreland Drive as a two-way, stop-controlled intersection since future traffic projections are not expected to reach warrant levels in 20 years. Add an eastbound right turn lane on Seldom Seen Road, 175 feet in length including storage and deceleration.
6. Addition of site traffic at study-area intersections was not found to lengthen existing turn lanes based on ODOT lane sizing calculations except at the Sawmill Parkway/Seldom Seen Road intersection. Turn lane lengths are shown for both “background” and “site” conditions on Figures 8 and 9. The comparison of the turn lane lengths shown indicates the only incremental difference due to site development is an added 25 feet for the southbound and westbound left turn movements at the Seldom Seen intersection.

A graphical summary of improvements has been provided as **Figure 8** and **Figure 9**. All necessary public roadway improvements associated with the development, including any off-site improvements, shall be constructed with the first phase of construction except as agreed upon by the Delaware County Engineer.

7.2 No Build (Non-Site) Improvements

The following are improvements related to No Build conditions that should be considered regardless of the proposed site or potential roadway network modifications and should not be considered the responsibility of the developer:

1. Install a traffic signal and northbound left turn lane at the Liberty Road/Seldom Seen Road intersection. This intersection meets a signal warrant now and experiences poor level of service in the eastbound left turn movement. The northbound left turn lane is warranted now and should be part of the signalization project. A southbound right turn lane is also warranted at this time as a background improvement but is not needed for capacity even in the design year with signalization. A roundabout could also be considered as an alternative improvement.
2. While not a part of this traffic study effort, previous concerns voiced by local residents accessing Sawmill Parkway via Parkwood Lane just south of Powell Grand suggest a northbound right turn lane should be constructed on Sawmill Parkway at Parkwood Lane.
3. Delaware County should coordinate with ODOT and MORPC to ensure that the MORPC projections of future traffic growth reflected in this study are carried forward and that public agencies partner to consider additional network-wide improvements to support anticipated background traffic growth.
4. Long range growth in the Sawmill Parkway corridor, as forecast by MORPC, will produce an 80% increase in traffic volumes by 2036. The resultant north/south volumes are consistent with three lanes in each direction. Local agencies should begin planning for those improvements, particularly as Sawmill Parkway is extended north to US 42 as intended.

Though not committed improvements at this time, projected future conditions to address the 2036 traffic forecast have been illustrated on **Figure 9**.

FIGURE 8: 2016 Recommended Improvements

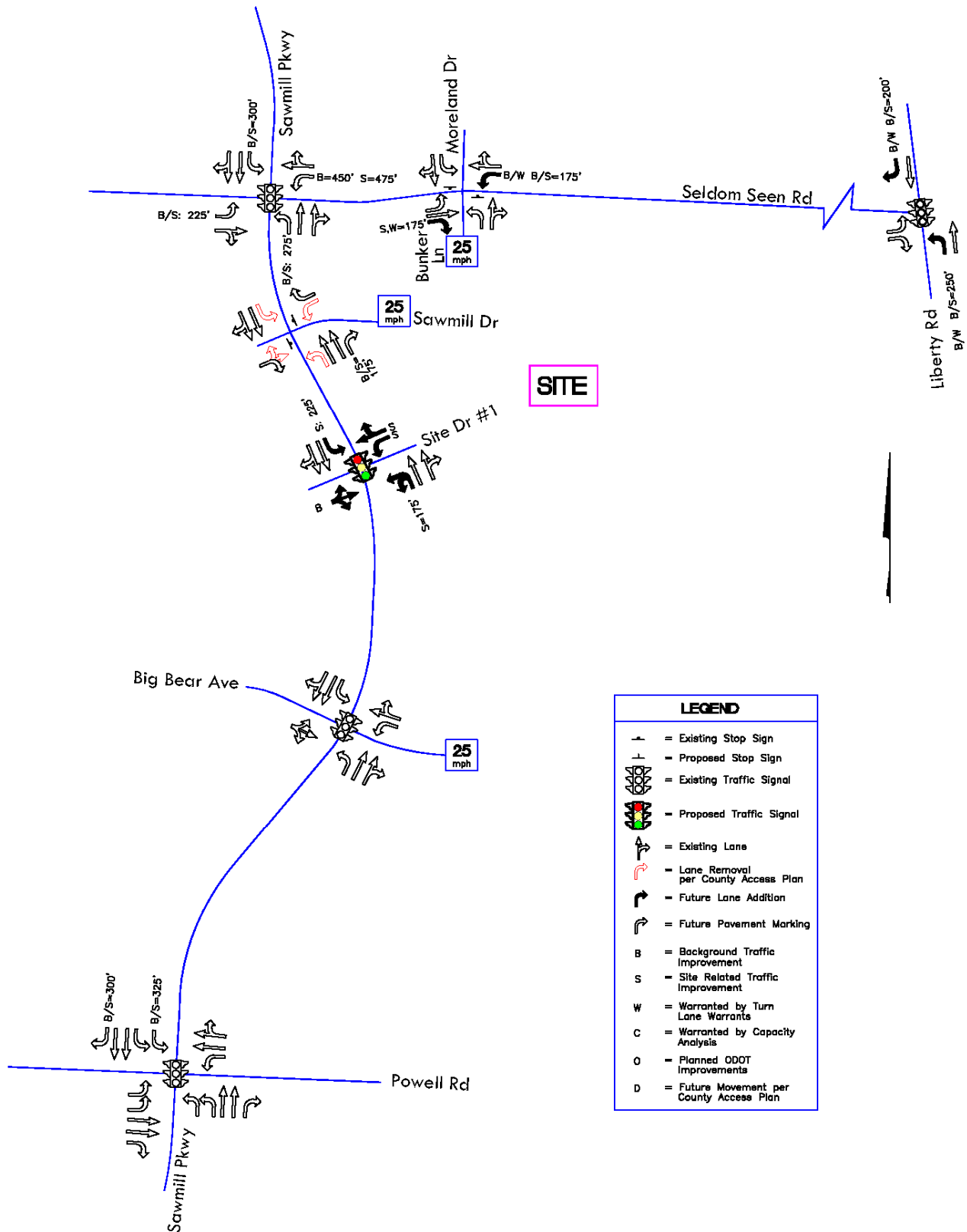
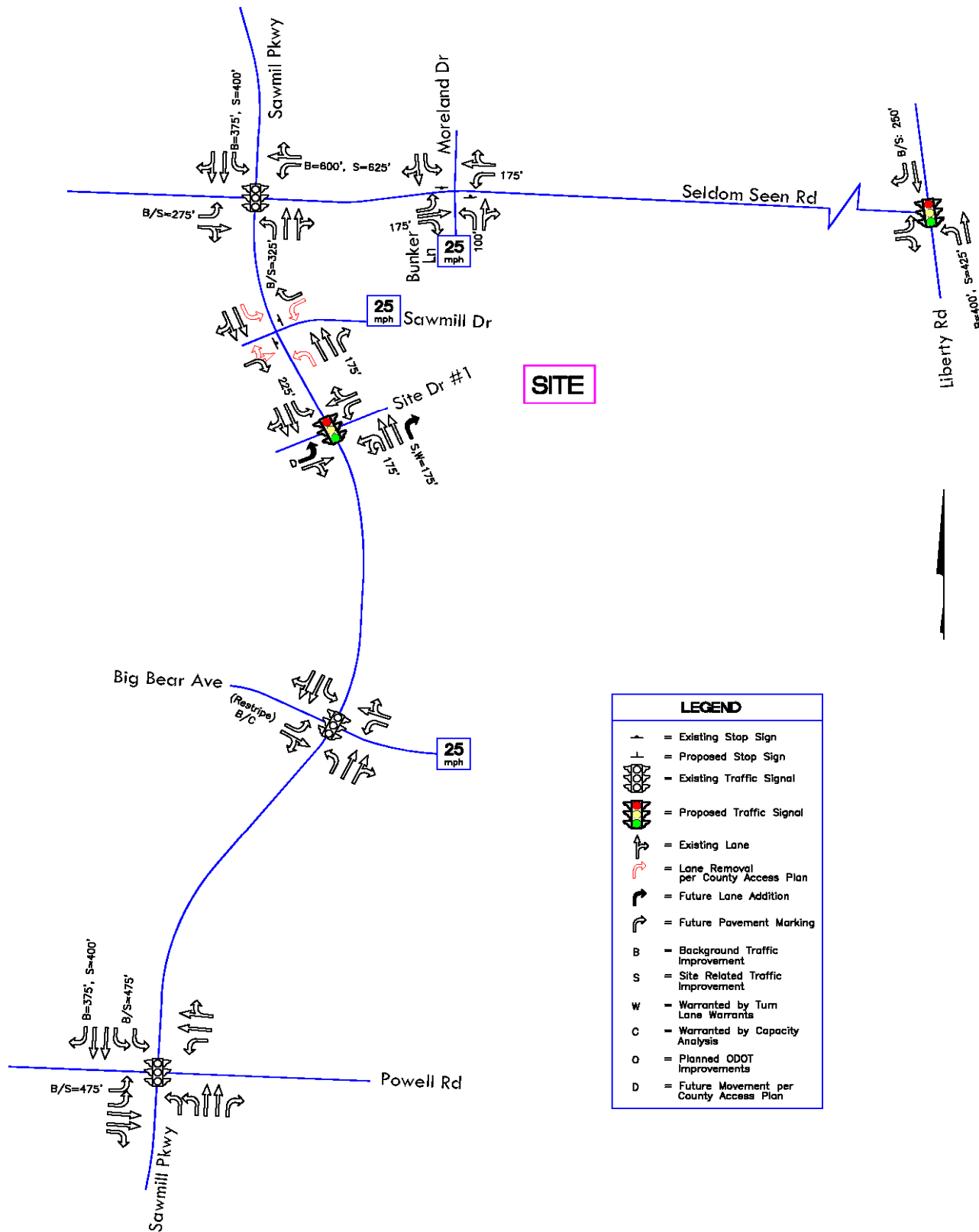


FIGURE 9: 2036 Expected Future Conditions

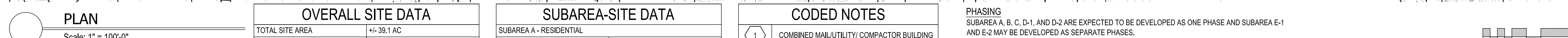




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EXHIBIT 1:

Site Plan



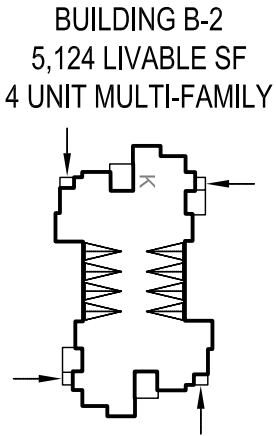
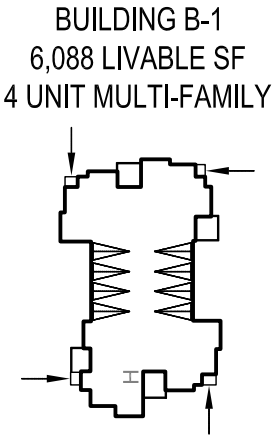
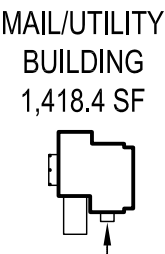
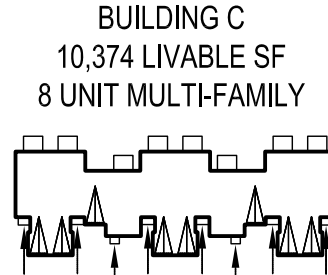
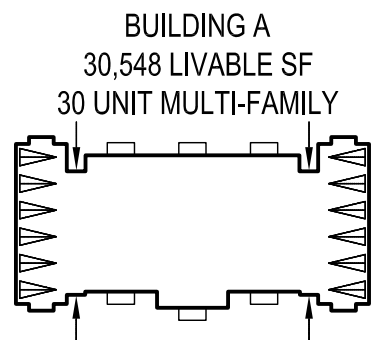
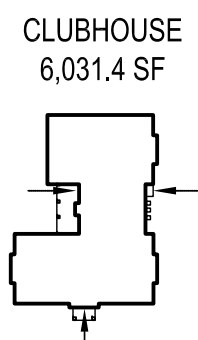
SUBAREA-SITE DATA	
SUBAREA A - RESIDENTIAL	
ACREAGE	+/-5.24 AC
UNITS	120 D.U.
PARKING PROVIDED	300 spaces (2.5 spaces/unit)
SUBAREA B - RESIDENTIAL	
ACREAGE	+/-10.1 AC
UNITS	60 D.U.
PARKING PROVIDED	246 spaces (4 spaces/unit)
SUBAREA C - RESIDENTIAL	
ACREAGE	+/-14.2 AC
UNITS	128 D.U.
PARKING PROVIDED	401 spaces (3 spaces/unit)
SUBAREA D-1 - OPEN SPACE	
ACREAGE	+/-1.35 AC
SUBAREA D-2 - CLUBHOUSE/AMENITIES	
ACREAGE	+/-2.1 AC
SUBAREA E-1 - COMMERCIAL	
ACREAGE	+/-2.3 AC
SUBAREA E-2 - COMMERCIAL	
ACREAGE	+/-2.6 AC

CODED NOTES	
1	COMBINED MAIL/UTILITY/ COMPACTOR BUILDING
2	8' ASPHALT BIKE PATH (TYP.)
3	CLUBHOUSE
4	POOL
5	PATIO/ENTERTAINMENT SPACE
6	PUTTING GREEN
7	COMMUNITY GARDEN
8	DOG PARK
9	GAZEBO/PATIO
10	4' CONCRETE SIDEWALK (TYP.)
11	ENTRY GATE

PROPOSED STRUCTURES

→ ENTRANCEWAYS

▷ GARAGES



no. revisions: by:

job no: 6285150010
date: 05/20/2015
sheet:

E-1

1 of: 1



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APPENDIX A:

Approved MOU
Data Collected



Engineers, Surveyors, Planners, Scientists

March 23, 2015

Mr. John A. Piccin, PE, PS
Deputy Development Engineer
Delaware County Engineer's Office
50 Channing Street
Delaware, OH 43015

*Approved as
Noted
3/30/15
MAL*

Subject: Seldom Seen Acres Senior Living Site TIS
Memorandum of Understanding

Dear Mr. Piccin,

This Memorandum of Understanding has been prepared to document the scope of the above captioned traffic study for a new development that we have been discussing. The site is located in the southeast quadrant of the Sawmill Road/Seldom Seen Road Intersection in Delaware County, Ohio. In accordance with County standards our pre-meeting conversation was held via email on March 6, 2015 with the staff of Delaware County Engineer's Office. Following your concurrence, EMH&T will prepare an impact study in accordance with the methodologies and assumptions described below.

Proposed Development & Access Plan

The study will be prepared to determine the transportation impact associated with developing 308 senior living condominiums in three distinct styles. The site is also expected to include five acres of space that could be developed at up to 50,000 square feet of commercial space. The site access will be analyzed and compared to No Build conditions to identify site-related impacts. Both existing public street access points to the site will remain, one access to Sawmill Parkway via Sawmill Drive which will be converted to right-in/right-out only access, and one access to Seldom Seen Road via Bunker Lane. The study will analyze one (1) access scenario that utilizes only one (1) additional access comprised of a new full movement, signalized access point to Sawmill Parkway south of Sawmill Drive with no additional access to Seldom Seen Road.

Data Collection

Per our conversations, we plan to re-use the manual turning movement counts used in the previous study at this location. These previous counts were conducted by EMH&T personnel at the following intersections in November, 2012 during the 7-9 AM and 4-6 PM peak hours:

- Sawmill Parkway/Powell Road (SR 750)
- Sawmill Parkway/Big Bear Avenue
- Sawmill Parkway/Sawmill Drive
- Sawmill Parkway/Seldom Seen Road
- Seldom Seen Road/Bunker Lane

March 23, 2015

The Seldom Seen Road & Liberty Road manual turning movement count was conducted from 7 AM to 6 PM in November, 2012 to complete signal warrant analyses. Additional counts were performed in December, 2012 from 6-8 PM. Traffic count data to be used in preparing this study is attached for reference.

Traffic Volume Projections

Background traffic growth rates were previously provided by the Mid-Ohio Regional Planning Commission (MORPC) on January 10, 2013. Recommended growth rates for the study area provided by MORPC included:

- Sawmill Parkway- 3%
- Powell Road- 2%
- Seldom Seen Road- 2.5%
- Liberty Road- 3%

Opening day and design year, morning and afternoon peak hour traffic volumes will be projected for a single build scenario that includes all proposed access with the full buildout scenario. Opening Year is assumed as Year 2016 and the Design Year will be Year 2036. Traffic data will be developed for the following scenarios:

- 2016 Background (existing conditions) *→ w/ day care, only*
- 2016 Full Build with Proposed Access
- 2036 Background *→ w/ day care & office*
- 2036 Full Build with Proposed Access

- 2016 Full Build w/ proposed access w/ any roadway improvements
- 2036 Full Build w/ proposed access w/ any roadway improvements

Morning and afternoon weekday peak hour site generated trip ends for the proposed development will be forecast using trip generation rates for land use code #251 (Senior Housing - Attached), #252 (Senior Housing - Detached) and #710 (Office) as published in Trip Generation, 9th Edition (Institute of Transportation Engineers, 2012). Site generated trip ends will be distributed to the adjacent street network according to patterns observed in the manual traffic count procedure and engineering judgment regarding likely destinations for work-based trips during peak hours. Other development traffic will be included in the background condition for the adjacent daycare facility and office parcel along the Sawmill Parkway frontage and the site on the west side of Sawmill Parkway, which the County is expected to provide trip data for. Site-generated trips will be added to background traffic to determine full build traffic volumes.

We will re-use trip distribution assumptions from the previous efforts that includes input from Delaware County Engineer personnel. The expected gateway distributions are listed below:

- From/to Sawmill Parkway north - 25%
- From/to Sawmill Parkway south - 50%
- From/to Seldom Seen Road west - 4%
- From/to Liberty Road north - 4%
- From/to Liberty Road south - 7%
- From/to Powell Road east - 4%
- From/to Powell Road west - 6%

March 23, 2015

Reports and Documentation

A detailed report including applicable figures and tables will be prepared to summarize study methodologies, analysis, findings and recommendations. The report will be submitted to the Delaware County Engineer for review. Please signify your concurrence with the scope of work outlined herein by signing below and returning this Memorandum of Understanding to me. Should questions or comments arise during your review of this memorandum or if I may be of further assistance in this matter, please contact me directly at (614) 775-4650.

Sincerely,



Douglas A. Bender, PE, PTOE
Senior Traffic Engineer

Copies: Don Hunter, Schottenstein Real Estate Group
Vince Margello, Margello Development

ACCEPTANCE AND APPROVAL OF MEMORANDUM OF UNDERSTANDING

By: Michael A. Howe

Date: 3/30/15

Seldom Seen Acres Senior Living
Traffic Impact Study
Trip Generation Calculations
Institute of Transportation Engineers, 9th Edition

Off site

Land Use	Square Feet or Units	ITE Code	Time Period	ITE Formula	Total Trips	Trips Entering	Trips Exiting
<u>Day Care Center</u>	10,000 sf	565	ADT	Average Rate = 74.06	742	371	370
			AM Peak	Average Rate = 12.18	122	65	57
			PM Peak	Average Rate = 12.34	123	58	65
<u>Office</u>	9,000 sf	710	ADT	$\ln(T)=0.76\ln(x)+3.68$	212	106	106
			AM Peak	$\ln(T)=0.80\ln(x)+1.57$	28	25	3
			PM Peak	$T=1.12(x)+78.45$	89	15	74
Total			ADT		954	477	476
			AM Peak		150	90	60
			PM Peak		212	73	139

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File Name : Sawmill Pkwy - Powell
Site Code : 00000000
Start Date : 11/7/2012
Page No : 1

Groups Printed- Cars - Trucks

Start Time	SAWMILL PKWY Southbound					POWELL Westbound					SAWMILL PKWY Northbound					POWELL Eastbound					Intl. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
*** BREAK ***																					
07:00 AM	41	208	12	0	261	10	34	15	0	59	23	93	13	0	129	18	32	16	0	66	515
07:15 AM	48	210	29	0	287	19	41	11	0	71	33	81	17	0	131	23	46	18	0	87	576
07:30 AM	36	193	27	0	256	22	56	5	0	83	43	117	13	0	173	27	48	16	0	91	603
07:45 AM	48	222	24	0	294	21	43	10	0	74	31	120	15	0	166	22	58	24	0	104	638
Total	173	833	92	0	1098	72	174	41	0	287	130	411	58	0	599	90	184	74	0	348	2332
08:00 AM	43	197	30	0	270	23	42	10	0	75	30	87	19	0	136	27	46	18	0	91	572
08:15 AM	42	188	12	0	242	38	35	12	0	85	31	90	20	0	141	17	59	18	0	94	562
08:30 AM	52	194	19	0	265	36	49	11	0	96	49	97	15	0	161	38	59	27	0	124	646
08:45 AM	40	176	30	0	246	25	57	13	0	95	35	109	23	0	167	31	55	29	0	115	623
Total	177	755	91	0	1023	122	183	46	0	351	145	383	77	0	605	113	219	92	0	424	2403
*** BREAK ***																					
04:00 PM	50	113	19	0	182	59	58	20	0	137	41	176	26	0	243	52	60	25	0	137	699
04:15 PM	49	144	12	0	205	37	70	18	0	125	55	206	26	0	287	65	80	29	0	174	791
04:30 PM	66	130	14	0	210	31	59	24	0	114	45	292	24	0	361	58	60	33	0	151	836
04:45 PM	50	160	15	0	225	46	64	26	0	136	44	248	23	0	315	69	61	31	0	161	837
Total	215	547	60	0	822	173	251	88	0	512	185	922	99	0	1206	244	261	118	0	623	3163
05:00 PM	61	166	16	0	243	48	51	25	0	124	50	294	31	0	375	78	71	20	0	169	911
05:15 PM	60	167	19	0	246	50	56	34	0	140	40	257	32	0	329	97	88	19	0	204	919
05:30 PM	63	163	23	0	249	45	65	28	0	138	59	290	20	0	369	66	59	18	0	143	899
05:45 PM	66	160	29	0	255	43	70	32	0	145	64	258	29	0	351	87	76	28	0	191	942
Total	250	656	87	0	993	186	242	119	0	547	213	1099	112	0	1424	328	294	85	0	707	3671
Grand Total	815	2791	330	0	3936	553	850	294	0	1697	673	2815	346	0	3834	775	958	369	0	2102	11569
Apprch %	20.7	70.9	8.4	0		32.6	50.1	17.3	0		17.6	73.4	9	0		36.9	45.6	17.6	0		
Total %	7	24.1	2.9	0	34	4.8	7.3	2.5	0	14.7	5.8	24.3	3	0	33.1	6.7	8.3	3.2	0	18.2	
Cars	795	2763	322	0	3880	551	834	289	0	1674	656	2759	341	0	3756	763	950	356	0	2069	11379
% Cars	97.5	99	97.6	0	98.6	99.6	98.1	98.3	0	98.6	97.5	98	98.6	0	98	98.5	99.2	96.5	0	98.4	98.4
Trucks	20	28	8	0	56	2	16	5	0	23	17	56	5	0	78	12	8	13	0	33	190
% Trucks	2.5	1	2.4	0	1.4	0.4	1.9	1.7	0	1.4	2.5	2	1.4	0	2	1.5	0.8	3.5	0	1.6	1.6

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File Name : Sawmill Pkwy - Big Bear Ave
Site Code : 00000000
Start Date : 11/7/2012
Page No : 1

Groups Printed- Cars - Trucks

Start Time	SAWMILL PRKWY Southbound					BIG BEAR AVE Westbound					SAWMILL PRKWY Northbound					BIG BEAR AVE Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	4	217	3	1	225	8	1	2	0	11	1	170	7	0	178	14	0	22	0	36	450
07:15 AM	4	250	4	1	259	10	0	5	0	15	2	108	5	0	115	7	2	17	1	27	416
07:30 AM	5	249	5	0	259	9	0	2	0	11	3	128	4	0	135	3	1	14	0	18	423
07:45 AM	9	282	3	0	294	10	0	6	0	16	2	146	8	0	156	6	3	9	0	18	484
Total	22	998	15	2	1037	37	1	15	0	53	8	552	24	0	584	30	6	62	1	99	1773
08:00 AM	10	282	2	0	294	6	1	5	1	13	3	136	19	1	159	3	2	15	0	20	486
08:15 AM	3	248	1	0	252	13	0	5	0	18	4	105	10	0	119	1	0	11	1	13	402
08:30 AM	17	242	3	0	262	5	1	2	4	12	3	109	26	1	139	4	7	15	0	26	439
08:45 AM	11	222	2	0	235	45	10	22	3	80	5	118	19	0	142	2	5	14	1	22	479
Total	41	994	8	0	1043	69	12	34	8	123	15	468	74	2	559	10	14	55	2	81	1806
*** BREAK ***																					
04:00 PM	7	169	2	1	179	8	1	4	1	14	12	239	13	1	265	11	2	9	1	23	481
04:15 PM	4	194	7	0	205	4	1	4	0	9	8	285	6	0	299	8	2	10	0	20	533
04:30 PM	2	177	4	0	183	5	0	5	0	10	12	372	11	0	395	15	0	16	0	31	619
04:45 PM	10	231	8	2	251	7	2	4	0	13	13	333	19	0	365	6	6	10	2	24	653
Total	23	771	21	3	818	24	4	17	1	46	45	1229	49	1	1324	40	10	45	3	98	2286
05:00 PM	3	190	7	0	200	7	3	4	1	15	12	378	10	1	401	8	5	10	0	23	639
05:15 PM	5	249	6	0	260	18	2	2	0	22	12	384	22	0	418	8	4	6	2	20	720
05:30 PM	5	197	3	0	205	12	5	6	1	24	12	373	11	2	398	14	5	11	0	30	657
05:45 PM	3	247	5	1	256	16	5	7	2	30	11	340	25	1	377	10	6	7	1	24	687
Total	16	883	21	1	921	53	15	19	4	91	47	1475	68	4	1594	40	20	34	3	97	2703
Grand Total	102	3646	65	6	3819	183	32	85	13	313	115	3724	215	7	4061	120	50	196	9	375	8568
Apprch %	2.7	95.5	1.7	0.2		58.5	10.2	27.2	4.2		2.8	91.7	5.3	0.2		32	13.3	52.3	2.4		
Total %	1.2	42.6	0.8	0.1	44.6	2.1	0.4	1	0.2	3.7	1.3	43.5	2.5	0.1	47.4	1.4	0.6	2.3	0.1	4.4	
Cars	94	3583	62	6	3745	179	30	73	13	295	114	3646	206	7	3973	117	50	195	9	371	8384
% Cars	92.2	98.3	95.4	100	98.1	97.8	93.8	85.9	100	94.2	99.1	97.9	95.8	100	97.8	97.5	100	99.5	100	98.9	97.9
Trucks	8	63	3	0	74	4	2	12	0	18	1	78	9	0	88	3	0	1	0	4	184
% Trucks	7.8	1.7	4.6	0	1.9	2.2	6.2	14.1	0	5.8	0.9	2.1	4.2	0	2.2	2.5	0	0.5	0	1.1	2.1

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File Name : Sawmill Pkwy - Sawmill Dr
Site Code : 11071201
Start Date : 11/7/2012
Page No : 1

Groups Printed- Cars - Trucks

Start Time	SAWMILL PKWY Southbound					SAWMILL DR Westbound					SAWMILL PKWY Northbound					SAWMILL DR Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	2	226	1	0	229	5	0	3	0	8	1	153	3	1	158	3	0	9	0	12	407
07:15 AM	1	244	0	0	245	5	0	0	0	5	3	110	3	0	116	2	0	3	1	6	372
07:30 AM	1	231	0	0	232	7	0	2	0	9	3	144	1	0	148	1	0	8	1	10	399
07:45 AM	2	297	1	0	300	1	0	2	0	3	3	154	7	0	164	0	0	7	0	7	474
Total	6	998	2	0	1006	18	0	7	0	25	10	561	14	1	586	6	0	27	2	35	1652
08:00 AM	2	268	0	0	270	10	0	3	0	13	7	121	5	0	133	0	1	0	1	2	418
08:15 AM	1	234	2	0	237	6	1	0	0	7	3	94	7	0	104	1	0	9	0	10	358
08:30 AM	2	234	0	0	236	1	0	1	0	2	2	116	9	0	127	3	1	7	0	11	376
08:45 AM	2	227	3	0	232	6	0	1	0	7	3	116	13	0	132	3	0	7	1	11	382
Total	7	963	5	0	975	23	1	5	0	29	15	447	34	0	496	7	2	23	2	34	1534

*** BREAK ***

04:00 PM	0	166	2	0	168	0	0	0	0	0	3	234	15	2	254	0	0	4	3	7	429
04:15 PM	0	207	2	0	209	3	0	0	0	3	5	288	11	1	305	0	1	5	0	6	523
04:30 PM	0	163	4	0	167	3	0	0	3	6	6	368	19	3	396	0	0	8	0	8	577
04:45 PM	1	225	1	0	227	6	0	2	3	11	7	318	12	0	337	1	0	6	1	8	583
Total	1	761	9	0	771	12	0	2	6	20	21	1208	57	6	1292	1	1	23	4	29	2112
05:00 PM	0	191	0	1	192	5	0	3	0	8	10	381	16	0	407	2	1	5	2	10	617
05:15 PM	3	257	1	0	261	3	0	2	0	5	11	343	27	0	381	1	0	3	3	7	654
05:30 PM	0	200	1	4	205	2	0	2	2	6	7	364	26	0	397	1	0	3	2	6	614
05:45 PM	0	220	4	0	224	2	0	0	0	2	7	298	21	0	326	1	1	6	1	9	561
Total	3	868	6	5	882	12	0	7	2	21	35	1386	90	0	1511	5	2	17	8	32	2446

*** BREAK ***

Grand Total	17	3590	22	5	3634	65	1	21	8	95	81	3602	195	7	3885	19	5	90	16	130	7744
Apprch %	0.5	98.8	0.6	0.1		68.4	1.1	22.1	8.4		2.1	92.7	5	0.2		14.6	3.8	69.2	12.3		
Total %	0.2	46.4	0.3	0.1	46.9	0.8	0	0.3	0.1	1.2	1	46.5	2.5	0.1	50.2	0.2	0.1	1.2	0.2	1.7	
Cars	17	3534	21	5	3577	65	1	21	8	95	76	3527	195	7	3805	19	5	87	16	127	7604
% Cars	100	98.4	95.5	100	98.4	100	100	100	100	100	93.8	97.9	100	100	97.9	100	100	96.7	100	97.7	98.2
Trucks	0	56	1	0	57	0	0	0	0	0	5	75	0	0	80	0	0	3	0	3	140
% Trucks	0	1.6	4.5	0	1.6	0	0	0	0	0	6.2	2.1	0	0	2.1	0	0	3.3	0	2.3	1.8

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File Name : Sawmill Pkwy - Seldom Seen
Site Code : 00000000
Start Date : 11/8/2012
Page No : 1

Groups Printed- Cars - Trucks

Start Time	SAWMILL Southbound					SELDOM SEEN Westbound					SAWMILL Northbound					SELDOM SEEN Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
*** BREAK ***																					
07:00 AM	16	192	25	0	233	34	9	15	0	58	8	131	8	0	147	16	7	19	0	42	480
07:15 AM	11	183	15	0	209	21	4	9	0	34	6	98	4	0	108	6	12	19	0	37	388
07:30 AM	11	222	3	0	236	49	6	10	0	65	6	90	21	0	117	10	13	18	0	41	459
07:45 AM	14	176	19	0	209	44	8	16	0	68	9	115	26	0	150	5	13	20	0	38	465
Total	52	773	62	0	887	148	27	50	0	225	29	434	59	0	522	37	45	76	0	158	1792
08:00 AM	19	178	2	0	199	39	7	5	0	51	3	85	19	0	107	5	16	18	0	39	396
08:15 AM	15	167	4	0	186	38	11	6	0	55	10	89	18	0	117	6	9	18	0	33	391
08:30 AM	16	187	4	0	207	48	8	13	0	69	10	114	33	0	157	6	17	20	0	43	476
08:45 AM	22	149	1	0	172	27	14	11	0	52	9	95	28	0	132	5	10	14	0	29	385
Total	72	681	11	0	764	152	40	35	0	227	32	383	98	0	513	22	52	70	0	144	1648
*** BREAK ***																					
04:00 PM	24	115	5	0	144	30	15	18	0	63	23	186	44	0	253	8	20	18	0	46	506
04:15 PM	26	114	15	0	155	59	13	31	0	103	14	192	39	0	245	4	12	18	0	34	537
04:30 PM	14	141	3	0	158	53	12	17	0	82	13	206	63	0	282	7	17	13	0	37	559
04:45 PM	16	151	3	0	170	51	18	23	0	92	18	243	51	0	312	4	19	16	0	39	613
Total	80	521	26	0	627	193	58	89	0	340	68	827	197	0	1092	23	68	65	0	156	2215
05:00 PM	21	111	6	0	138	50	11	27	0	88	24	265	45	0	334	8	25	15	0	48	608
05:15 PM	28	159	4	0	191	65	28	22	0	115	17	274	65	0	356	11	21	19	0	51	713
05:30 PM	20	177	6	0	203	60	11	16	0	87	16	279	56	0	351	14	23	16	0	53	694
05:45 PM	23	179	5	0	207	56	22	21	0	99	19	268	50	0	337	14	18	18	0	50	693
Total	92	626	21	0	739	231	72	86	0	389	76	1086	216	0	1378	47	87	68	0	202	2708
Grand Total	296	2601	120	0	3017	724	197	260	0	1181	205	2730	570	0	3505	129	252	279	0	660	8363
Apprch %	9.8	86.2	4	0		61.3	16.7	22	0		5.8	77.9	16.3	0		19.5	38.2	42.3	0		
Total %	3.5	31.1	1.4	0	36.1	8.7	2.4	3.1	0	14.1	2.5	32.6	6.8	0	41.9	1.5	3	3.3	0	7.9	
Cars	289	2566	114	0	2969	716	197	257	0	1170	201	2681	563	0	3445	123	249	278	0	650	8234
% Cars	97.6	98.7	95	0	98.4	98.9	100	98.8	0	99.1	98	98.2	98.8	0	98.3	95.3	98.8	99.6	0	98.5	98.5
Trucks	7	35	6	0	48	8	0	3	0	11	4	49	7	0	60	6	3	1	0	10	129
% Trucks	2.4	1.3	5	0	1.6	1.1	0	1.2	0	0.9	2	1.8	1.2	0	1.7	4.7	1.2	0.4	0	1.5	1.5

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File Name : Seldom Seen - Bunker
Site Code : 11081201
Start Date : 11/8/2012
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Groups Printed- Cars - Trucks

Start Time	Bunker Ln Southbound					SELDOM SEEN RD Westbound					BUNKER LN Northbound					SELDOM SEEN RD Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
*** BREAK ***																					
07:15 AM	1	1	4	0	6	2	28	0	0	30	7	1	2	0	10	5	27	8	0	40	86
07:30 AM	3	0	3	0	6	2	30	2	0	34	8	0	2	0	10	2	46	9	0	57	107
07:45 AM	3	1	2	0	6	2	37	5	0	44	5	0	6	0	11	2	59	17	0	78	139
Total	7	2	9	0	18	6	95	7	0	108	20	1	10	0	31	9	132	34	0	175	332
08:00 AM	1	0	4	0	5	0	47	4	0	51	9	0	4	0	13	1	40	8	0	49	118
08:15 AM	1	1	1	0	3	0	35	1	0	36	7	0	6	0	13	2	45	11	0	58	110
08:30 AM	1	0	3	0	4	2	48	2	0	52	5	1	7	0	13	4	49	2	0	55	124
08:45 AM	5	0	2	0	7	4	37	3	0	44	6	2	6	0	14	4	41	14	0	59	124
Total	8	1	10	0	19	6	167	10	0	183	27	3	23	0	53	11	175	35	0	221	476
*** BREAK ***																					
04:00 PM	4	0	3	2	9	3	66	7	0	76	4	0	6	0	10	3	61	9	3	76	171
04:15 PM	4	0	8	0	12	4	60	5	0	69	10	0	4	0	14	8	76	14	1	99	194
04:30 PM	6	0	5	0	11	9	72	2	0	83	5	0	7	0	12	7	56	3	1	67	173
04:45 PM	3	0	6	0	9	6	62	4	0	72	8	0	6	0	14	16	61	13	0	90	185
Total	17	0	22	2	41	22	260	18	0	300	27	0	23	0	50	34	254	39	5	332	723
05:00 PM	8	0	5	2	15	4	87	4	0	95	17	0	4	0	21	4	74	11	0	89	220
05:15 PM	5	1	5	0	11	8	74	8	0	90	10	0	10	0	20	4	72	9	1	86	207
05:30 PM	7	0	4	0	11	6	77	8	0	91	8	0	9	0	17	10	71	13	0	94	213
05:45 PM	5	0	7	0	12	8	69	6	0	83	8	0	5	0	13	7	65	8	0	80	188
Total	25	1	21	2	49	26	307	26	0	359	43	0	28	0	71	25	282	41	1	349	828
*** BREAK ***																					
06:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	57	4	62	4	127	60	830	61	0	951	117	4	84	0	205	79	843	149	6	1077	2360
Apprch %	44.9	3.1	48.8	3.1		6.3	87.3	6.4	0		57.1	2	41	0		7.3	78.3	13.8	0.6		
Total %	2.4	0.2	2.6	0.2	5.4	2.5	35.2	2.6	0	40.3	5	0.2	3.6	0	8.7	3.3	35.7	6.3	0.3	45.6	
Cars	57	4	62	4	127	59	818	61	0	938	117	4	84	0	205	79	832	146	6	1063	2333
% Cars	100	100	100	100	100	98.3	98.6	100	0	98.6	100	100	100	0	100	100	98.7	98	100	98.7	98.9
Trucks	0	0	0	0	0	1	12	0	0	13	0	0	0	0	0	0	11	3	0	14	27
% Trucks	0	0	0	0	0	1.7	1.4	0	0	1.4	0	0	0	0	0	0	1.3	2	0	1.3	1.1

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File Name : Sawmill Pkwy - Park Woods Ln
Site Code : 00000000
Start Date : 11/7/2012
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Groups Printed- Cars - Trucks

Start Time	SAWMILL PKWY Southbound					PARK WOODS LN Westbound					SAWMILL PKWY Northbound					PARK WOODS LN Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	242	0	2	244	1	0	0	0	1	0	156	1	0	157	0	0	0	0	0	402
07:15 AM	0	261	0	0	261	1	0	0	1	2	0	128	1	0	129	0	0	0	0	0	392
07:30 AM	0	258	0	0	258	6	0	0	0	6	0	144	0	0	144	0	0	0	0	0	408
07:45 AM	1	300	0	1	302	1	0	0	0	1	0	167	0	0	167	0	0	0	0	0	470
Total	1	1061	0	3	1065	9	0	0	1	10	0	595	2	0	597	0	0	0	0	0	1672
08:00 AM	0	267	0	0	267	5	0	0	1	6	0	121	0	0	121	0	0	0	0	0	394
08:15 AM	0	252	0	0	252	3	0	0	0	3	0	100	12	0	112	0	0	0	0	0	367
08:30 AM	0	244	0	0	244	4	0	1	0	5	0	120	2	1	123	0	0	0	0	0	372
08:45 AM	0	235	0	1	236	2	0	1	0	3	0	146	2	0	148	0	0	0	0	0	387
Total	0	998	0	1	999	14	0	2	1	17	0	487	16	1	504	0	0	0	0	0	1520
*** BREAK ***																					
04:00 PM	0	192	0	2	194	0	0	0	0	0	0	256	3	0	259	0	0	0	0	0	453
04:15 PM	0	201	0	0	201	4	0	2	0	6	0	329	6	0	335	0	0	0	0	0	542
04:30 PM	2	194	0	0	196	1	0	1	0	2	0	393	3	3	399	0	0	0	0	0	597
04:45 PM	2	223	0	1	226	3	0	0	0	3	0	353	3	3	359	0	0	0	0	0	588
Total	4	810	0	3	817	8	0	3	0	11	0	1331	15	6	1352	0	0	0	0	0	2180
05:00 PM	1	221	0	4	226	1	0	0	0	1	0	401	1	0	402	0	0	0	0	0	629
05:15 PM	0	259	0	1	260	3	0	1	1	5	0	375	3	1	379	0	0	0	0	0	644
05:30 PM	0	218	0	4	222	1	0	0	0	1	0	384	5	1	390	0	0	0	0	0	613
05:45 PM	0	246	0	2	248	1	0	2	0	3	0	355	5	0	360	0	0	0	0	0	611
Total	1	944	0	11	956	6	0	3	1	10	0	1515	14	2	1531	0	0	0	0	0	2497
Grand Total	6	3813	0	18	3837	37	0	8	3	48	0	3928	47	9	3984	0	0	0	0	0	7869
Apprch %	0.2	99.4	0	0.5	77.1	0	16.7	6.2			0	98.6	1.2	0.2		0	0	0	0		
Total %	0.1	48.5	0	0.2	48.8	0.5	0	0.1	0	0.6	0	49.9	0.6	0.1	50.6	0	0	0	0	0	
Cars	5	3723	0	18	3746	37	0	8	3	48	0	3825	47	9	3881	0	0	0	0	0	7675
% Cars	83.3	97.6	0	100	97.6	100	0	100	100	100	0	97.4	100	100	97.4	0	0	0	0	0	97.5
Trucks	1	90	0	0	91	0	0	0	0	0	0	103	0	0	103	0	0	0	0	0	194
% Trucks	16.7	2.4	0	0	2.4	0	0	0	0	0	0	2.6	0	0	2.6	0	0	0	0	0	2.5

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File Name : Seldom Seen - Liberty
Site Code : 00000000
Start Date : 11/13/2012
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Groups Printed- Cars - Trucks																					
Start Time	LIBERTY					SELDOM SEEN					LIBERTY					SELDOM SEEN					Int. Total
	Southbound					Westbound					Northbound					Eastbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	86	14	0	100	0	0	0	0	0	20	60	0	0	80	4	0	34	0	38	218
07:15 AM	0	94	10	0	104	0	0	0	0	0	24	47	0	0	71	1	0	46	0	47	222
07:30 AM	0	88	24	0	112	0	0	0	0	0	39	82	0	0	121	6	0	39	0	45	278
07:45 AM	0	86	38	0	124	0	0	0	0	0	38	75	0	0	113	8	0	37	0	45	282
Total	0	354	86	0	440	0	0	0	0	0	121	264	0	0	385	19	0	156	0	175	1000
08:00 AM	0	76	17	0	93	0	0	0	0	0	31	45	0	0	76	9	0	32	0	41	210
08:15 AM	0	59	16	0	75	0	0	0	0	0	32	42	0	0	74	8	0	46	1	55	204
08:30 AM	0	69	21	0	90	0	0	0	0	0	37	43	0	0	80	7	0	31	0	38	208
08:45 AM	0	60	33	0	93	0	0	0	0	0	23	54	0	0	77	11	0	25	0	36	206
Total	0	264	87	0	351	0	0	0	0	0	123	184	0	0	307	35	0	134	1	170	828
09:00 AM	0	52	23	0	75	0	0	0	0	0	21	57	0	0	78	14	0	30	1	45	198
09:15 AM	0	39	17	0	56	0	0	0	0	0	32	37	0	0	69	15	0	18	0	33	158
09:30 AM	0	55	16	0	71	0	0	0	0	0	19	37	0	0	56	14	0	26	0	40	167
09:45 AM	0	32	18	0	50	0	0	0	0	0	21	42	0	0	63	5	0	8	0	13	126
Total	0	178	74	0	252	0	0	0	0	0	93	173	0	0	266	48	0	82	1	131	649
10:00 AM	0	37	15	0	52	0	0	0	0	0	15	41	0	0	56	10	0	16	0	26	134
10:15 AM	0	38	12	0	50	0	0	0	0	0	14	30	0	0	44	12	0	27	0	39	133
10:30 AM	0	42	18	0	60	0	0	0	1	1	17	31	0	0	48	19	0	18	0	37	146
10:45 AM	0	42	15	0	57	0	0	0	1	1	18	33	0	0	51	9	0	30	0	39	148
Total	0	159	60	0	219	0	0	0	2	2	64	135	0	0	199	50	0	91	0	141	561
11:00 AM	0	49	17	0	66	0	0	0	0	0	15	34	0	0	49	10	0	23	0	33	148
11:15 AM	0	45	14	0	59	0	0	0	0	0	11	34	0	0	45	10	0	22	0	32	136
11:30 AM	0	47	19	0	66	0	0	0	0	0	21	38	0	0	59	7	0	26	0	33	158
11:45 AM	0	32	16	0	48	0	0	0	0	0	23	37	0	0	60	10	0	18	0	28	136
Total	0	173	66	0	239	0	0	0	0	0	70	143	0	0	213	37	0	89	0	126	578
12:00 PM	0	40	9	0	49	0	0	0	0	0	9	36	0	0	45	7	0	15	0	22	116
12:15 PM	0	41	6	0	47	0	0	0	0	0	19	43	0	0	62	7	0	35	0	42	151
12:30 PM	0	34	10	0	44	0	0	0	0	0	21	42	0	0	63	10	0	25	0	35	142
12:45 PM	0	47	9	0	56	0	0	0	0	0	21	30	0	0	51	13	0	22	0	35	142
Total	0	162	34	0	196	0	0	0	0	0	70	151	0	0	221	37	0	97	0	134	551
01:00 PM	0	49	20	0	69	0	0	0	0	0	15	33	0	0	48	16	0	20	0	36	153
01:15 PM	0	49	7	0	56	0	0	0	0	0	21	31	0	0	52	13	0	31	0	44	152
01:30 PM	0	37	13	0	50	0	0	0	0	0	18	52	0	0	70	14	0	23	0	37	157
01:45 PM	0	36	7	0	43	0	0	0	0	0	17	43	0	0	60	22	0	33	1	56	159
Total	0	171	47	0	218	0	0	0	0	0	71	159	0	0	230	65	0	107	1	173	621
02:00 PM	0	37	10	0	47	0	0	0	0	0	17	39	0	0	56	11	0	13	1	25	128
02:15 PM	0	35	20	0	55	0	0	0	0	0	28	48	0	0	76	21	0	25	0	46	177
02:30 PM	0	57	15	0	72	0	0	0	0	0	23	42	0	0	65	13	0	39	0	52	189
02:45 PM	0	91	14	0	105	0	0	0	0	0	22	59	0	0	81	15	0	33	0	48	234
Total	0	220	59	0	279	0	0	0	0	0	90	188	0	0	278	60	0	110	1	171	728
03:00 PM	0	68	14	0	82	0	0	0	0	0	39	65	0	1	105	18	0	47	0	65	252
03:15 PM	0	72	17	0	89	0	0	0	0	0	35	57	0	0	92	13	0	27	0	40	221
03:30 PM	0	57	16	0	73	0	0	0	0	0	33	87	0	0	120	21	0	31	0	52	245
03:45 PM	0	60	14	0	74	0	0	0	0	0	25	86	0	0	111	20	0	37	0	57	242
Total	0	257	61	0	318	0	0	0	0	0	132	295	0	1	428	72	0	142	0	214	960
04:00 PM	0	63	24	0	87	0	0	0	0	0	51	75	0	0	126	17	0	37	0	54	267
04:15 PM	0	65	21	0	86	0	0	0	0	0	40	66	0	0	106	13	0	37	0	50	242
04:30 PM	0	70	23	0	93	0	0	0	0	0	35	78	0	0	113	25	0	35	0	60	266
04:45 PM	0	76	19	0	95	0	0	0	0	0	41	110	0	0	151	17	0	43	0	60	306
Total	0	274	87	0	361	0	0	0	0	0	167	329	0	0	496	72	0	152	0	224	1081

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File Name : Seldom Seen - Liberty
Site Code : 00000000
Start Date : 11/13/2012
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Groups Printed- Cars - Trucks																					
Start Time	LIBERTY Southbound					SELDOM SEEN Westbound					LIBERTY Northbound					SELDOM SEEN Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
05:00 PM	0	82	25	0	107	0	0	0	0	0	44	112	0	0	156	21	0	53	0	74	337
05:15 PM	0	69	26	0	95	0	0	0	0	0	53	94	0	0	147	19	0	42	0	61	303
05:30 PM	0	54	27	0	81	0	0	0	0	0	34	91	0	0	125	30	0	44	0	74	280
05:45 PM	0	63	15	0	78	0	0	0	0	0	32	122	0	0	154	33	0	42	0	75	307
Total	0	268	93	0	361	0	0	0	0	0	163	419	0	0	582	103	0	181	0	284	1227
Grand Total	0	2480	754	0	3234	0	0	0	2	2	1164	2440	0	1	3605	598	0	1341	4	1943	8784
Apprch %	0	76.7	23.3	0		0	0	0	100		32.3	67.7	0	0		30.8	0	69	0.2		
Total %	0	28.2	8.6	0	36.8	0	0	0	0	0	13.3	27.8	0	0	41	6.8	0	15.3	0	22.1	
Cars	0	2403	735	0	3138	0	0	0	2	2	1155	2368	0	1	3524	579	0	1318	3	1900	8564
% Cars	0	96.9	97.5	0	97	0	0	0	100	100	99.2	97	0	100	97.8	96.8	0	98.3	75	97.8	97.5
Trucks	0	77	19	0	96	0	0	0	0	0	9	72	0	0	81	19	0	23	1	43	220
% Trucks	0	3.1	2.5	0	3	0	0	0	0	0	0.8	3	0	0	2.2	3.2	0	1.7	25	2.2	2.5

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File Name : Seldom Seen-Liberty 12-13
Site Code : 00000000
Start Date : 12/13/2012
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Groups Printed- Cars - Trucks																					
	LIBERTY					SELDOM SEEN					LIBERTY					SELDOM SEEN					Inl. Total
	Southbound					Westbound					Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
06:00 PM	0	58	20	0	78	0	0	0	0	0	47	97	0	0	144	23	0	47	0	70	292
06:15 PM	0	65	22	0	87	0	0	0	0	0	41	79	0	0	120	20	0	39	0	59	266
06:30 PM	0	50	35	0	85	0	0	0	0	0	39	85	0	0	124	22	0	42	0	64	273
06:45 PM	0	59	25	0	84	0	0	0	0	0	31	70	0	0	101	23	0	43	0	66	251
Total	0	232	102	0	334	0	0	0	0	0	158	331	0	0	489	88	0	171	0	259	1082
07:00 PM	0	50	22	0	72	0	0	0	0	0	43	74	0	0	117	32	0	37	0	69	258
07:15 PM	0	48	18	0	66	0	0	0	0	0	29	61	0	0	90	25	0	31	0	56	212
07:30 PM	0	25	17	0	42	0	0	0	0	0	25	52	0	0	77	23	0	31	0	54	173
07:45 PM	0	21	10	0	31	0	0	0	0	0	21	38	0	0	59	16	0	23	0	39	129
Total	0	144	67	0	211	0	0	0	0	0	118	225	0	0	343	96	0	122	0	218	772
Grand Total	0	376	169	0	545	0	0	0	0	0	276	556	0	0	832	184	0	293	0	477	1854
Apprch %	0	69	31	0		0	0	0	0		33.2	66.8	0	0		38.6	0	61.4	0		
Total %	0	20.3	9.1	0	29.4	0	0	0	0	0	14.9	30	0	0	44.9	9.9	0	15.8	0	25.7	
Cars	0	375	167	0	542	0	0	0	0	0	275	555	0	0	830	183	0	292	0	475	1847
% Cars	0	99.7	98.8	0	99.4	0	0	0	0	0	99.6	99.8	0	0	99.8	99.5	0	99.7	0	99.6	99.6
Trucks	0	1	2	0	3	0	0	0	0	0	1	1	0	0	2	1	0	1	0	2	7
% Trucks	0	0.3	1.2	0	0.6	0	0	0	0	0	0.4	0.2	0	0	0.2	0.5	0	0.3	0	0.4	0.4

Alford, Jennifer

From: Humenny, Justin
Sent: Thursday, December 06, 2012 2:07 PM
To: Alford, Jennifer
Cc: Creed, Larry
Subject: FW: Sawmill Pkwy / Seldom Seen Growth Rate

Here are the growth rates I received from MORPC.

From: Chandra Parasa [mailto:cparasa@morpc.org]
Sent: Thursday, December 06, 2012 10:15 AM
To: Humenny, Justin
Cc: Nick Gill
Subject: RE: Sawmill Pkwy / Seldom Seen Growth Rate

Justin,

We have completed your request for the overall growth rates for this study area, between Sawmill Parkway & Powell Road, to Seldom Seen Road & Liberty Road.

Please use a compounded annual growth rates for this study area as follows:

3% for all of Sawmill Parkway
2% for Powell Road
2.5% for Seldom Seen Road
3% for Liberty Road

Please note that the growth rates do reflect Sawmill Parkway being extended all the way to US 42.

Thanks,
Chad

From: Chandra Parasa
Sent: Tuesday, December 04, 2012 11:06 AM
To: 'Humenny, Justin'
Cc: Nick Gill
Subject: RE: Sawmill Pkwy / Seldom Seen Growth Rate

Justin,

We have almost completed processing this request. We are currently reviewing, will contact you soon.

Thanks,
Chad

From: Humenny, Justin [mailto:jhumenny@emht.com]
Sent: Tuesday, December 04, 2012 9:48 AM
To: Chandra Parasa
Subject: RE: Sawmill Pkwy / Seldom Seen Growth Rate

Chad,

Do you have a timetable on when this growth rate will be ready? We are being asked to submit our volumes to Delaware County as soon as we can. If there is any way you can make this a high priority it would be greatly appreciated. Thanks again for your assistance. Please let me know if you need anything else from me.

Justin

From: Chandra Parasa [<mailto:cparasa@morpc.org>]
Sent: Monday, November 26, 2012 4:21 PM
To: Humenny, Justin
Cc: Nick Gill
Subject: RE: Sawmill Pkwy / Seldom Seen Growth Rate

Justin,
Thanks for your email.
I was not in during thanksgiving holidays, got back today.
We are currently working on your request. I will keep you posted on status.

Thanks,
Chad

From: Humenny, Justin [<mailto:jhumenny@emht.com>]
Sent: Monday, November 26, 2012 3:47 PM
To: Chandra Parasa
Subject: Sawmill Pkwy / Seldom Seen Growth Rate

Chad,

Can you please give an update on the status of the requested growth rate for Sawmill Parkway and Seldom Seen Rd area? Please let me know if you need any additional information.

Also, we have received some concerns from the neighboring condo community, regarding the impact of the future extension of Sawmill Parkway to Rt 42. Will this be accounted for in the growth rate? If not, can you please provide comments on how volumes on Sawmill Parkway will be affected by this future extension? Thanks for your assistance, it is greatly appreciated.

Justin Humenny, E.I.
Traffic Engineer Intern

EMH&T

Engineers, Surveyors, Planners, Scientists
5500 New Albany Road, Columbus, OH 43054
v. 614.775.4647 | jhumenny@emht.com
emht.com

From: Humenny, Justin [<mailto:jhumenny@emht.com>]
Sent: Tuesday, November 20, 2012 7:44 AM
To: Chandra Parasa
Subject: RE: Growth rate request

Chad, I have attached a folder containing count data as excel files. Please let me know if you need anything else.

Thanks,
Justin

From: Chandra Parasa [<mailto:cparasa@morpc.org>]
Sent: Monday, November 19, 2012 4:23 PM
To: Humenny, Justin
Subject: RE: Growth rate request

Is it possible to send to us, selectable text in pdf or excel. We usually upload this in our database.

Thanks,
Chad

From: Humenny, Justin [<mailto:jhumenny@emht.com>]
Sent: Monday, November 19, 2012 2:33 PM
To: Chandra Parasa
Subject: RE: Growth rate request

We did not conduct 24 hour counts. An 8 hour signal warrant count was taken at Seldom Seen Rd & Liberty Rd. AM and PM turning movement counts were taken at the following intersections:

- Sawmill Parkway & Powell Rd
- Sawmill Parkway & Big Bear Ave
- Sawmill Parkway & Park Woods Ln
- Sawmill Parkway & Sawmill Dr
- Sawmill Parkway & Seldom Seen Rd
- Seldom Seen Rd & Bunker Ln

These are all of the intersections in our study area. We would just like an overall growth rate for this study area.

Thanks,
Justin

From: Chandra Parasa [<mailto:cparasa@morpc.org>]
Sent: Monday, November 19, 2012 2:15 PM
To: Humenny, Justin
Subject: RE: Growth rate request

Just curious if there were 24 hour counts conducted.

Are Growth rates needed for Sawmill Parkway and Seldom Seen Road, or, please advise what other additional roadway segments.

Thanks,
Chad

From: Humenny, Justin [<mailto:jhumenny@emht.com>]
Sent: Monday, November 19, 2012 1:30 PM
To: Chandra Parasa
Subject: RE: Growth rate request

Chad,
I have attached count data for the 7 intersections in the Powell area. Please let me know if you need anything else.

Thanks,
Justin

From: Chandra Parasa [<mailto:cparasa@morpc.org>]
Sent: Monday, November 19, 2012 12:55 PM
To: Humenny, Justin
Cc: Nick Gill; Hwashik Jang; Zhuojun Jiang
Subject: RE: Growth rate request

Hi Justin,
Please email to us traffic counts that you have collected in that area.
We would be using these data in our computations.

Thanks,
Chad

From: Humenny, Justin [<mailto:jhumenny@emht.com>]
Sent: Monday, November 19, 2012 12:52 PM
To: Chandra Parasa
Subject: Growth rate request

Chad,

I am working on a traffic study for a Lifestyle Communities development in Powell near the intersection of Sawmill Parkway and Seldom Seen Road. Could you please provide a background traffic growth rate for this area? We just finished a series of counts in the area, and I need to project these volumes to an opening year 2013, and horizon year 2033. If you need any additional information or have any questions please let me know.

Thanks,

Justin Humenny, E.I.
Traffic Engineer Intern

EMH&T

Engineers, Surveyors, Planners, Scientists
5500 New Albany Road, Columbus, OH 43054
v. 614.775.4647 | jhumenny@emht.com
emht.com

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APPENDIX B:

Traffic Volume Calculations

Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

2012 Count Volumes (7:15-8:15)														AM Peak Hour a			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH				
39	759	55	153	25	153	13	2	8	11	142	6	89	344				
Seldom Seen Rd																	
LT	26	24	388	70	10	29	1	14	194	159	132	249	249				
RT	75	54	482	RT	TH	RT	TH	RT	TH	RT	TH	RT	TH				
987	1047	7	539	7	42	SITE											
RT	TH	LT	TH	LT	TH												
1	1040	6	23	16	529												
LT	TH	LT	TH	LT	TH												
Sawmill Dr																	
TH	1	18	561	16	561	SITE											
RT	1081	1087	1087	RT	TH												
TH	1087	LT	Drive 1	560	TH												
1087	TH	RT	LT	TH	RT												
Big Bear Ave																	
RT	TH	LT	TH	LT	TH	RT	TH	LT	TH	LT	TH	RT	TH				
14	1063	28	35	10	518	36	18	1	555	561	555	561	555				
LT	19	8	55	36	18	555	561	555	561	555	561	555	561				
TH	8	55	36	18	555	561	555	561	555	561	555	561	555				
RT	TH	LT	TH	LT	TH	RT	TH	LT	TH	LT	TH	RT	TH				
110	822	175	85	137	405	64	36	182	TH	132	249	132	249				
LT	99	198	76	137	405	64	36	182	TH	132	249	132	249				
TH	198	76	137	405	64	36	182	TH	132	249	132	249	249				
RT	76	137	405	64	36	182	TH	132	249	132	249	132	249				

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Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

2012 Balanced Volumes										AM Peak Hour at			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH
39	819	55	143	55	143	13	2	8	11	142	6	89	344
Seldom Seen Rd										Drive 2			
LT	26	24	445	70	RT	LT	10	29	1	14	RT	LT	24
TH	54	LT	539	539	RT	TH	172	LT	TH	TH	RT	RT	132
RT	75	RT	539	539	RT	RT	42	42	TH	TH	RT	RT	249
1037													
1037													
Sowmill Dr										SITE			
RT	TH	LT	0	TH	RT	LT	16	529	16				
1	1030	6	23	LT	TH	RT	1	LT	TH				
LT	3	16	529	16	RT	LT	1	LT	TH				
TH	1	LT	561	561	RT	LT	1	LT	TH				
RT	18	RT	561	561	RT	LT	1	LT	TH				
1071													
1071													
1071													
TH	LT	RT	Drive 1	LT	RT	560	TH	RT	561				
1071													
Big Bear Ave										Powell Rd			
RT	TH	LT	18	RT	555	LT	10	518	36	RT	TH	LT	85
14	1041	28	35	LT	RT	LT	10	518	36	RT	TH	LT	85
LT	19	8	55	LT	RT	LT	10	518	36	RT	TH	LT	85
TH	8	RT	55	LT	RT	LT	10	518	36	RT	TH	LT	85
RT	55	RT	55	LT	RT	LT	10	518	36	RT	TH	LT	85
110	822	175	85	LT	RT	LT	10	518	36	RT	TH	LT	85
LT	99	137	405	64	RT	LT	10	518	36	RT	TH	LT	85
TH	198	LT	76	RT	561	LT	10	518	36	RT	TH	LT	85
RT	76	RT	76	RT	561	LT	10	518	36	RT	TH	LT	85

N
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Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

2016 Background Traffic Volumes												AM Peak Hour b = a(1+g)/N	
Sawmill Parkway & Liberty Road Growth Rate: 3.0%				Powell Road Growth Rate: 2.0%				Seldom Seen Road Growth Rate: 2.5%					
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH
44	922	62	158	28	157	7	14	29	100	387	149	280	
LT	29	27	499	79	RT	RT	TH	RT	RT	TH	RT	TH	
TH	60	60	60	60	60	60	60	60	60	60	60	60	
RT	83	83	83	83	83	83	83	83	83	83	83	83	
RT	TH	LT	0	TH	Sawmill Dr	16	TH	Drive 1	TH	Drive 1	TH	Drive 1	
1	1159	6	23	LT	16	RT	16	RT	630	TH	RT	630	
LT	3	16	595	16	RT	16	RT	16	18	TH	RT	18	
TH	1	1	1	1	1	1	1	1	1	1	1	1	
RT	18	18	18	18	18	18	18	18	18	18	18	18	
TH	1205	LT	RT	TH	Drive 1	TH	Drive 1	TH	1205	TH	RT	1205	
16	1172	32	35	LT	Big Bear Ave	41	RT	41	16	1172	32	35	
TH	8	8	8	8	8	8	8	8	8	8	8	8	
RT	55	55	55	55	55	55	55	55	55	55	55	55	
RT	TH	LT	39	TH	RT	39	TH	RT	39	TH	RT	39	
124	925	197	92	LT	Powell Rd	72	TH	72	124	925	197	92	
LT	107	154	456	72	RT	72	RT	72	107	154	456	72	
TH	214	214	214	214	214	214	214	214	214	214	214	214	
RT	82	82	82	82	82	82	82	82	82	82	82	82	

2016 Background Traffic Volumes											
R/O @ Sawmill Dr											
RT	TH	LT	44	RT	TH	LT	44	RT	TH	LT	44
44	922	62	158	28	157	7	14	29	100	387	149
LT	29	27	499	79	RT	RT	TH	RT	RT	TH	RT
TH	60	60	60	60	60	60	60	60	60	60	60
RT	83	83	83	83	83	83	83	83	83	83	83
RT	TH	LT	7	RT	TH	LT	7	RT	TH	LT	7
1	1165	x	x	x	598	22	x	598	22	x	598
LT	x	x	x	x	598	22	x	598	22	x	598
TH	x	x	x	x	598	22	x	598	22	x	598
RT	10	10	10	10	10	10	10	10	10	10	10
TH	1169	0	0	TH	Drive 1	TH	Drive 1	TH	Drive 1	TH	Drive 1
0	1169	0	0	0	16	614	0	16	614	0	16
LT	3	3	3	LT	16	614	3	16	614	3	16
TH	1	1	1	TH	16	614	1	16	614	1	16
RT	8	8	8	RT	16	614	8	16	614	8	16
TH	RT	TH	TH	TH	RT	TH	TH	TH	RT	TH	TH

Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

Off site: Office and Day care										AM Peak Hour		
Trip Distribution - Primary Trips Inbound										c1		
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	TH
25%	2%	2%	0%	0%	0%	2%	9%	2%	11%	4%	7%	TH
LT	TH	RT	LT	TH	RT	LT	TH	RT	TH	LT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	LT
2%	2%	2%	0%	0%	0%	2%	2%	2%	0%	0%	0%	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	TH	RT	TH	

[illegible]

\\C:\HWDATA01\Project01\20142045\Calculations\Traffic\TripGen\2014 2045 Trip Gen.xls

5/6/2015
8 of 20

AM Peak Hour

c0=c3+c4

2016 Total off site trips with proposed access

RT

TH

LT

0

RT

Seldom Seen Rd

RT

TH

LT

0

0

1

TH

LT

0

6

1

TH

LT

0

3

RT

TH

0

RT	TH	LT	0	RT	Seldom Seen Rd	RT	TH	LT	0	0	1	TH	LT	0	7	0	TH	LT	0	3	RT	TH	0
0	16	0	1	LT	2	14	2	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
LT	0	TH	1	LT	TH	RT	RT	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
RT	1	RT	1	RT	1	TH	RT	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
RT	TH	LT	0	RT	11	RT	RT	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	18	0	0	TH	0	TH	Sawmill Dr	TH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	18	0	0	TH	0	TH	0	TH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TH	0	TH	0	TH	0	TH	13	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RT	0	RT	0	RT	0	RT	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RT	TH	LT	0	RT	7	RT	Drive 1	TH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	18	0	LT	34	LT	0	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT	0	TH	0	LT	0	LT	13	TH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TH	0	TH	0	LT	0	LT	26	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RT	0	RT	0	RT	0	RT	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RT	TH	LT	0	RT	0	RT	Big Bear Ave	TH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	34	0	0	LT	0	LT	0	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TH	0	TH	0	LT	0	LT	0	TH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RT	0	RT	0	RT	0	RT	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RT	TH	LT	0	RT	3	RT	Powell Rd	TH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	29	2	0	LT	0	LT	0	LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LT	4	0	0	LT	0	LT	0	TH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TH	0	TH	0	RT	0	RT	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RT	0	RT	0	RT	0	RT	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Seldom Seen Acres Senior Living Traffic Impact Study Traffic Volume Calculations

[illegible]

[illegible]

Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

AM Peak Hour

d3=d1+d2

2036 Total off site trips

RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT			RT			TH			LT					
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Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

Site Trip Assignment- Primary Trips Inbound										AM Peak Hour d3			
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	5	RT	0	TH	LT	0	TH	0
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	0	TH	0	LT	0	TH	0	LT
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	0	TH	0	LT	0	TH	0	LT
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	0	TH	0	LT	0	TH	0	LT
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	0	TH	0	LT	0	TH	0	LT
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	0	TH	0	LT	0	TH	0	LT
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	0	TH	0	LT	0	TH	0	LT
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	0	TH	0	LT	0	TH	0	LT
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0	RT	0	TH	LT	0	TH	0	LT	0	TH	0	LT
<div> <div>RT</div> <div>TH</div> <div>LT</div> <div>U</div> </div>	0												

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Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

Site										AM Peak Hour d5=d3+d4									
Total site trips																			
RT 0	TH	16	15	1	TH	8	RT	Seldom Seen Rd		RT	0	TH	0	LT	0	TH	0	RT	0
	LT	0	0	1	TH	1	TH	9	RT	27	TH	0	LT	0	TH	0	RT	0	0
	TH	3	3	3	LT	3	LT	3	TH	RT	TH	3	TH	3	LT	0	TH	3	0
	RT	0	0	0	RT	0	RT	0	RT	0	RT	0	TH	0	TH	0	LT	5	0
RT 0	TH	37	0	0	TH	7	TH	Sawmill Dr		RT	0	TH	0	LT	0	TH	0	RT	0
	LT	0	0	0	TH	0	TH	29	RT	14	TH	0	LT	0	TH	0	RT	0	0
	TH	0	0	0	LT	0	LT	0	TH	RT	TH	0	LT	0	TH	0	RT	0	0
	RT	0	0	0	RT	0	RT	0	RT	0	RT	0	TH	0	TH	0	LT	5	0
RT 0	TH	13	24	0	U	5	RT	Drive 1		RT	0	TH	0	LT	0	TH	0	RT	0
	LT	0	0	0	U	27	LT	38	TH	38	TH	0	LT	0	TH	0	RT	0	0
	TH	0	0	0	U	0	U	0	TH	RT	TH	0	LT	0	TH	0	RT	0	0
	RT	0	0	0	RT	0	RT	0	RT	0	RT	0	TH	0	TH	0	LT	5	0
RT 0	TH	40	0	0	TH	0	RT	Parkwoods Ln		RT	0	TH	0	LT	0	TH	0	RT	0
	LT	0	0	0	TH	76	TH	0	RT	0	TH	0	LT	0	TH	0	RT	0	0
	TH	0	0	0	TH	0	RT	0	RT	0	TH	0	LT	0	TH	0	RT	0	0
	RT	0	0	0	TH	0	TH	0	TH	0	TH	0	LT	0	TH	0	RT	0	0
RT 0	TH	40	0	0	LT	0	LT	Big Bear Ave		RT	0	TH	0	LT	0	TH	0	RT	0
	LT	0	0	0	LT	0	LT	76	TH	0	TH	0	LT	0	TH	0	RT	0	0
	TH	0	0	0	LT	0	LT	0	TH	RT	TH	0	LT	0	TH	0	RT	0	0
	RT	0	0	0	RT	0	RT	0	RT	0	TH	0	LT	0	TH	0	RT	0	0
RT 4	TH	33	3	0	TH	5	RT	Powell Rd		RT	0	TH	0	LT	0	TH	0	RT	0
	LT	0	0	0	TH	0	TH	0	TH	0	TH	0	LT	0	TH	0	RT	0	0
	TH	0	0	0	LT	0	LT	63	TH	0	TH	0	LT	0	TH	0	RT	0	0
	RT	0	0	0	RT	0	RT	0	RT	0	TH	0	LT	0	TH	0	RT	0	0

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Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

2036 Background Traffic Volumes										AM Peak Hour e=a(1+g) ^N	
Sawmill Parkway & Liberty Road Growth Rate: 3.0%					Powell Road Growth Rate: 2.0%						
Sawmill Dr					Seldom Seen Road Growth Rate: 2.5%						
RT	TH	LT	TH	LT	RT	TH	LT	TH	LT	RT	TH
79	1665	112	259	112	11	257	6	14	274	181	699
LT	47	98	49	905	142	10	311	14	333	43	268
RT	136	136	RT	RT	RT	42	42	RT	RT	RT	506
Sawmill Dr					Bunker Lane					Liberty Rd	
RT	TH	LT	TH	LT	RT	TH	LT	TH	LT	RT	TH
1	2094	6	23	16	1075	16	1	1	1	1	1
LT	TH	LT	TH	LT	RT	RT	RT	RT	RT	RT	RT
RT	18	18	RT	RT	RT	RT	RT	RT	RT	RT	RT
Drive 1					Drive 2						
TH	LT	TH	LT	TH	TH	LT	TH	LT	TH	TH	TH
2177	0	1138	0	1138	0	0	0	0	0	0	0
TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT
Big Bear Ave					Powell Rd						
RT	TH	LT	TH	LT	RT	TH	LT	TH	LT	RT	TH
28	2116	57	35	137	20	1053	73	20	1053	73	20
LT	TH	LT	TH	LT	RT	RT	RT	RT	RT	RT	RT
RT	55	55	RT	RT	RT	RT	RT	RT	RT	RT	RT
Powell Rd					Sawmill Dr						
RT	TH	LT	TH	LT	RT	TH	LT	TH	LT	RT	TH
224	1671	356	137	137	58	293	137	137	137	137	137
LT	TH	LT	TH	LT	RT	RT	RT	RT	RT	RT	RT
RT	122	122	RT	RT	RT	RT	RT	RT	RT	RT	RT

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2036 Background Traffic Volumes									
R/O @ Sawmill Dr									
RT	TH	LT	TH	LT	RT	TH	LT	TH	LT
79	1665	112	259	112	72	45	259	45	142
LT	47	98	49	905	7	0	49	0	142
RT	136	136	RT	RT	RT	RT	RT	RT	RT
Sawmill Dr					Sawmill Dr				
RT	TH	LT	TH	LT	RT	TH	LT	TH	LT
1	2100	6	23	16	1	2100	6	23	16
LT	TH	LT	TH	LT	LT	TH	LT	TH	LT
RT	18	18	RT	RT	RT	18	RT	RT	RT
Drive 1					Drive 1				
TH	LT	TH	LT	TH	TH	LT	TH	LT	TH
2104	0	1138	0	1138	0	0	0	0	0
TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
RT	RT	RT	RT	RT	RT	RT	RT	RT	RT

Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

2016 Background plus off-site										AM Peak Hour f=b+c5			
Background					Off-site					Liberty Rd			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	RT	TH	TH
44	938	62	159	13	2	8	13	1	183	0	103	387	280
LT	29	61	29	513	81	RT	TH	18	TH	220	RT	174	LT
TH	61	RT	TH	513	81	RT	TH	18	TH	220	RT	174	LT
RT	84		LT	513	81	RT	TH	18	TH	220	RT	174	LT
Seldom Seen Rd					Sawmill Dr					Powell Rd			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	RT	TH	TH
1	1159	24	57	16	595	55	13	2	8	13	1	183	0
LT	3	18	16	595	55	RT	TH	18	TH	220	RT	174	LT
TH	1	RT	TH	595	55	RT	TH	18	TH	220	RT	174	LT
RT	18		LT	595	55	RT	TH	18	TH	220	RT	174	LT
Drive 1					Drive 2					Off site consists of Day care			
TH	TH	LT	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH	TH
1239	0	0	0	0	0	0	0	0	0	0	0	0	0
LT	0	0	0	0	0	0	0	0	0	0	0	0	0
TH	0	0	0	0	0	0	0	0	0	0	0	0	0
RT	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Bear Ave					Powell Rd					Off site consists of Day care			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	RT	TH	TH
16	1206	32	35	11	622	41	13	2	8	13	1	183	0
LT	19	8	11	622	41	RT	TH	18	TH	220	RT	174	LT
TH	8	RT	TH	622	41	RT	TH	18	TH	220	RT	174	LT
RT	55		LT	622	41	RT	TH	18	TH	220	RT	174	LT
Powell Rd					Off site consists of Day care					Off site consists of Day care			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	RT	TH	TH
127	954	199	92	154	489	72	13	2	8	13	1	183	0
LT	111	214	154	489	72	RT	TH	18	TH	220	RT	174	LT
TH	214	RT	TH	489	72	RT	TH	18	TH	220	RT	174	LT
RT	82		LT	489	72	RT	TH	18	TH	220	RT	174	LT

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Background plus off-site with proposed access														AM Peak Hour g=e+d3			
RT	TH	LT	72	RT	Seldom Seen Rd					11	RT	TH	RT	TH			
	LT	1688	112	45	TH	13	2	8	14	259	TH	LT	RT	TH			
TH	LT	47	51	920	145	RT	TH	RT	TH	10	29	1	18	46			
	TH	99	RT	LT	TH	RT	TH	RT	TH	314	LT	TH	RT	TH			
RT		138											274	506			
													LT	TH			
													RT	TH			
													0	340			
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2036 Full build with proposed access										AM Peak Hour g1=g+d5			
		Seldom Seen Rd		Sowmill Dr		Bunker Lane		Drive 2		Liberty Rd			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH
79	170.4	127	278	1.3	2	1.1	26.4	23	1	23	1	190	699
		LT	47	52	929	172	RT	10	8	0	0	LT	49
		TH	102	LT	TH	RT	TH	317	TH	RT	TH	RT	288
		RT	141	RT	RT	RT	RT	86	RT	0	0	LT	283
		RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT
		1	216.3	0	0	1126	54	0	0	0	0	0	0
		LT	TH	TH	LT	TH	RT	0	0	0	0	0	0
		RT	10	RT	RT	RT	RT	0	0	0	0	0	0
		RT	TH	LT	U	13	RT	0	0	0	0	0	0
		0	211.7	50	6	86	LT	0	0	0	0	0	0
		LT	TH	TH	LT	0	16	1178	74	0	0	0	0
		TH	1	U	LT	TH	RT	0	0	0	0	0	0
		RT	8	RT	RT	RT	RT	0	0	0	0	0	0
		RT	TH	LT	18	RT	0	0	0	0	0	0	0
		28	219.2	57	35	LT	0	0	0	0	0	0	0
		LT	TH	TH	20	1183	73	0	0	0	0	0	0
		TH	8	LT	TH	RT	0	0	0	0	0	0	0
		RT	55	RT	RT	0	0	0	0	0	0	0	0
		RT	TH	LT	67	RT	0	0	0	0	0	0	0
		232	173.4	361	137	LT	0	0	0	0	0	0	0
		LT	TH	TH	278	931	130	0	0	0	0	0	0
		TH	318	LT	TH	RT	0	0	0	0	0	0	0
		RT	122	RT	RT	0	0	0	0	0	0	0	0

Off site consists of Day care and office

Drive 2

Bunker Lane

Liberty Rd

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Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

2016 Background Traffic Volumes Sawmill Parkway & Liberty Road												PM Peak Hour $b = a(1+g)^N$	
Sawmill Parkway				Liberty Road				Powell Road				Growth Rates	
3.0%				2.0%				2.5%					
RT	TH	LT	95	RT	TH	LT	95	RT	TH	LT	95	RT	TH
24	693	104	79	TH	339	TH	29	TH	396	TH	105	302	183
LT	52	86	1253	243	LT	25	43	0	28	TH	370	RT	114
TH	96	LT	TH	RT	TH	311	LT	TH	RT	RT	RT	200	472
RT	75	RT	75	RT	RT	41	RT	RT	RT	RT	RT	RT	TH
<div> <div>Site</div> <div>Drive 2</div> <div>Liberty Rd</div> </div>													
RT	TH	LT	7	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT
6	1014	3	12	LT	Sawmill Dr	90	LT	TH	RT	RT	RT	RT	RT
TH	2	LT	TH	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT
RT	17	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT
<div> <div>Site</div> <div>Drive 1</div> <div>Liberty Rd</div> </div>													
TH	LT	RT	LT	RT	Drive 1	171	TH	RT	RT	RT	RT	RT	RT
1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047	1047
TH	LT	RT	LT	RT	Drive 1	171	TH	RT	RT	RT	RT	RT	RT
<div> <div>Site</div> <div>Drive 1</div> <div>Liberty Rd</div> </div>													
RT	TH	LT	19	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT
24	1001	18	53	LT	Big Bear Ave	77	LT	TH	RT	RT	RT	RT	RT
TH	20	LT	53	1660	77	RT	TH	RT	RT	RT	RT	RT	RT
RT	34	RT	34	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT
<div> <div>Site</div> <div>Drive 1</div> <div>Liberty Rd</div> </div>													
RT	TH	LT	129	RT	RT	RT	RT	RT	RT	RT	RT	RT	RT
98	738	281	262	TH	RT	RT	RT	RT	RT	RT	RT	RT	RT
TH	318	LT	201	LT	Powell Rd	126	LT	TH	RT	RT	RT	RT	RT
RT	92	RT	355	240	1237	126	RT	RT	RT	RT	RT	RT	RT

N
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2016 Background Traffic Volumes R/RO @ Sawmill Dr											
RT	TH	LT	95	RT	TH	LT	95	RT	TH	LT	95
24	693	104	79	TH	339	TH	29	TH	396	TH	105
LT	52	86	1253	243	LT	25	43	0	28	TH	370
TH	96	LT	TH	RT	TH	311	LT	TH	RT	RT	RT
RT	75	RT	75	RT	RT	41	RT	RT	RT	RT	RT
<div> <div>Site</div> <div>Drive 2</div> <div>Liberty Rd</div> </div>											
RT	TH	LT	7	RT	RT	RT	RT	RT	RT	RT	RT
6	1017	x	x	LT	Sawmill Dr	93	LT	TH	RT	RT	RT
TH	x	LT	x	TH	RT	RT	TH	RT	RT	RT	RT
RT	10	RT	10	RT	RT	RT	RT	RT	RT	RT	RT
<div> <div>Site</div> <div>Drive 1</div> <div>Liberty Rd</div> </div>											
RT	TH	LT	0	TH	Drive 1	12	LT	TH	RT	RT	RT
0	1024	0	3	LT	5	0	35	1679	TH	TH	RT
TH	2	U	U	LT	2	U	LT	TH	TH	TH	RT
RT	8	RT	8	RT	8	RT	RT	RT	RT	RT	RT

Off site: Office and Day care										PM Peak Hour	
Trip Distribution - Primary Trips Inbound										c1	
		RT		TH		LT		RT		TH	
RT		TH	LT	25%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
TH		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
LT		TH	LT	2%	2%	TH	LT	0%	2%	TH	LT
RT		TH	LT								

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2016 Total off site trips															PM Peak Hour c3=c3+c4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Seldom Seen					Seldom Seen Rd					Bunker Lane					Drive 2					Liberty Rd					N ←																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
RT	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT		0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT	0	RT	0	TH	LT

Seldom Seen Acres Senior Living Traffic Impact Study Traffic Volume Calculations

[illegible]

[illegible]

[illegible]

2036 Total off site trips										PM Peak Hour d3=d1+d2			
RT		TH	LT	0	RT	TH	LT	0	RT	TH	LT	0	RT
0		18	0	2	LT	0	0	0	0	0	0	0	0
TH		1	1	6	TH	5	RT	0	0	0	0	0	0
RT		1	1	1	LT	5	RT	0	0	0	0	0	0
RT		TH	LT	28	RT	TH	LT	0	0	0	0	0	0
0		21	0	0	TH	18	15	0	0	0	0	0	0
TH		TH	LT	0	TH	18	15	0	0	0	0	0	0
RT		0	0	0	LT	0	0	0	0	0	0	0	0
RT		TH	LT	18	RT	TH	LT	0	0	0	0	0	0
0		0	21	0	0	0	0	0	0	0	0	0	0
LT		0	0	0	LT	0	0	0	0	0	0	0	0
TH		0	0	0	TH	0	0	0	0	0	0	0	0
RT		0	0	0	RT	0	0	0	0	0	0	0	0
RT		TH	LT	0	RT	TH	LT	0	0	0	0	0	0
0		84	0	0	LT	0	0	0	0	0	0	0	0
LT		0	0	0	LT	0	0	0	0	0	0	0	0
TH		0	0	0	TH	0	0	0	0	0	0	0	0
RT		0	0	0	RT	0	0	0	0	0	0	0	0
RT		TH	LT	0	RT	TH	LT	0	0	0	0	0	0
0		84	0	0	LT	0	0	0	0	0	0	0	0
LT		0	0	0	LT	0	0	0	0	0	0	0	0
TH		0	0	0	TH	0	0	0	0	0	0	0	0
RT		0	0	0	RT	0	0	0	0	0	0	0	0
RT		TH	LT	3	RT	TH	LT	0	0	0	0	0	0
8		70	6	0	LT	0	0	0	0	0	0	0	0
TH		0	0	0	TH	0	0	0	0	0	0	0	0
RT		0	0	0	RT	0	0	0	0	0	0	0	0

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\\CMHDATA01\Project01\20142045\Calculations\Traffic\TripGen\2014 2045 Trip Gen.xls

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Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

Site										PM Peak Hour d5=d3+d4									
Total site trips																			
SITE	RT	TH	LT	18	RT	TH	LT	3	TH	LT	0	RT	TH	LT	0	RT	TH	LT	0
	0	11	10	21	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	3	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	2	2	2	RT	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	RT	TH	LT	17	RT	TH	LT	0	TH	LT	0	RT	TH	LT	0	RT	TH	LT	0
	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	TH	LT	12	RT	TH	LT	0	TH	LT	0	RT	TH	LT	0	RT	TH	LT	0
	0	18	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sawmill Pkwy	RT	TH	LT	0	RT	TH	LT	0	TH	LT	0	RT	TH	LT	0	RT	TH	LT	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parkwoods Ln	RT	TH	LT	0	RT	TH	LT	0	TH	LT	0	RT	TH	LT	0	RT	TH	LT	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Big Bear Ave	RT	TH	LT	0	RT	TH	LT	0	TH	LT	0	RT	TH	LT	0	RT	TH	LT	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Powell Rd	RT	TH	LT	0	RT	TH	LT	0	TH	LT	0	RT	TH	LT	0	RT	TH	LT	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TH	LT	0	0	TH	LT	0	0	0	0	0	0	0	0	0	0	0	0	0
	RT	0	0	0	RT	0	0	0	0	0	0	0	0	0	0	0	0	0	0

N
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Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

2036 Background Traffic Volumes										PM Peak Hour e=af(1+g)/N	
Sawmill Parkway & Liberty Road Growth Rate: 3.0%					Powell Road Growth Rate: 2.0%						
Sawmill Parkway & Liberty Road Growth Rate: 2.5%					Seldom Seen Road Growth Rate: 2.5%						
RT	TH	LT	RT	TH	LT	TH	LT	TH	LT	TH	LT
43	1252	187	43	1252	187	43	1252	187	43	1252	187
LT	85	154	2267	439	RT	LT	85	154	2267	439	RT
TH	157	RT	123	RT	607	TH	157	RT	123	607	TH
RT	123	RT	123	RT	607	RT	123	RT	123	607	RT
RT	TH	LT	0	TH	Sawmill Dr	RT	TH	LT	0	TH	Sawmill Dr
6	1832	3	12	LT	90	6	1832	3	12	LT	90
LT	5	35	2836	90	RT	LT	5	35	2836	90	RT
TH	2	LT	TH	RT	RT	TH	2	LT	TH	RT	RT
RT	17	RT	17	RT	RT	RT	17	RT	17	RT	RT
TH	LT	RT	LT	Drive 1	Drive 1	TH	LT	RT	LT	Drive 1	Drive 1
1890	X	3090	X	RT	RT	1890	X	3090	X	RT	RT
TH	LT	RT	LT	RT	RT	TH	LT	RT	LT	RT	RT
43	1807	33	53	LT	Big Bear Ave	43	1807	33	53	LT	Big Bear Ave
LT	40	96	2998	138	RT	LT	40	96	2998	138	RT
TH	20	LT	TH	RT	RT	TH	20	LT	TH	RT	RT
RT	34	RT	34	RT	RT	RT	34	RT	34	RT	RT
RT	TH	LT	RT	TH	Powell Rd	RT	TH	LT	RT	TH	Powell Rd
177	1334	508	299	LT	228	177	1334	508	299	LT	228
LT	528	433	2234	228	RT	LT	528	433	2234	228	RT
TH	473	LT	TH	RT	RT	TH	473	LT	TH	RT	RT
RT	137	RT	137	RT	RT	RT	137	RT	137	RT	RT

2036 Background Traffic Volumes									
R/O @ Sawmill Dr									
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT
43	1252	187	43	1252	187	43	1252	187	43
LT	85	154	2267	439	RT	LT	85	154	2267
TH	157	RT	123	RT	607	TH	157	RT	123
RT	123	RT	123	RT	607	RT	123	RT	123
RT	TH	LT	0	TH	Sawmill Dr	RT	TH	LT	0
6	1832	3	12	LT	90	6	1832	3	12
LT	5	35	2836	90	RT	LT	5	35	2836
TH	2	LT	TH	RT	RT	TH	2	LT	TH
RT	17	RT	17	RT	RT	RT	17	RT	17
TH	LT	RT	LT	Drive 1	Drive 1	TH	LT	RT	LT
1890	X	3090	X	RT	RT	1890	X	3090	X
TH	LT	RT	LT	RT	RT	TH	LT	RT	LT
43	1807	33	53	LT	Big Bear Ave	43	1807	33	53
LT	40	96	2998	138	RT	LT	40	96	2998
TH	20	LT	TH	RT	RT	TH	20	LT	TH
RT	34	RT	34	RT	RT	RT	34	RT	34
RT	TH	LT	RT	TH	Powell Rd	RT	TH	LT	RT
177	1334	508	299	LT	228	177	1334	508	299
LT	528	433	2234	228	RT	LT	528	433	2234
TH	473	LT	TH	RT	RT	TH	473	LT	TH
RT	137	RT	137	RT	RT	RT	137	RT	137

Seldom Seen Acres Senior Living
Traffic Impact Study
Traffic Volume Calculations

2016 Background plus off-site										PM Peak Hour f=b+c5			
Background					Off-site					Background			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH
24	708	104	245	1	25	34	1	25	34	1	25	34	1
TH	52	89	1269	246	RT	TH	52	89	1269	246	RT	TH	52
RT	97	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97
RT	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97	76
Seldom Seen Rd					Sawmill Dr					Bunker Lane			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH
6	1014	20	51	1	25	34	1	25	34	1	25	34	1
TH	52	89	1269	246	RT	TH	52	89	1269	246	RT	TH	52
RT	97	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97
RT	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97	76
Drive 1					Drive 2					Liberty Rd			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH
1086	0	0	0	0	0	0	0	0	0	0	0	0	0
TH	52	89	1269	246	RT	TH	52	89	1269	246	RT	TH	52
RT	97	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97
RT	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97	76
Big Bear Ave					Powell Rd					Off site consists of Day care			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH
24	1040	18	53	1	25	34	1	25	34	1	25	34	1
TH	52	89	1269	246	RT	TH	52	89	1269	246	RT	TH	52
RT	97	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97
RT	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97	76
North					South					East			
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH
102	771	284	201	1	25	34	1	25	34	1	25	34	1
TH	52	89	1269	246	RT	TH	52	89	1269	246	RT	TH	52
RT	97	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97
RT	76	LT	TH	RT	TH	97	76	LT	TH	RT	TH	97	76

2016 Full Build with proposed access										PM Peak Hour f1=b+c+d5									
RT		TH	LT	113	RT	TH	Seldom Seen Rd	RT	TH	LT	29	RT	TH	RT	TH	TH	TH	TH	TH
24		719	114	82	266	LT		21	1	25	40	LT	0	0	411	0	0	110	302
LT		52	92	92	1289	268	RT	RT	TH	TH	83	0	44	TH	394	0	0	123	472
TH		99	78	LT	TH	RT			RT	TH	320	LT	TH	RT	0	0	0	216	TH
RT										RT	70							LT	
RT		TH	LT	37	RT														
6		1068	####	####	####	LT	Sawmill Dr												
LT		####	####	####	####	LT													
TH		####	####	####	####	TH													
RT		10				RT													
RT		TH	LT	20	RT														
0		1042	33	0	TH		Drive 1												
LT				124	LT														
TH				0	35	1717	49												
RT				U	LT	TH	RT												
RT				8															
RT		TH	LT	19	RT														
24		1131	18	15	TH														
LT				53	LT		Big Bear Ave												
TH				40	53	1747	77												
RT				20	LT	TH	RT												
RT				34															
RT		TH	LT	134	RT														
111		847	290	262	TH														
LT				201	LT		Powell Rd												
TH				363	240	1309	126												
RT				LT	TH	RT													
RT				92															

Off site consists of Day care

Liberty Rd

Drive 2

Bunker Lane

← N

2036 Background plus off-site with proposed access											PM Peak Hour g=e+d3
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	TH
43	1270	187	402	1	25	33	43	0	37	RT	TH
LT	85	160	2302	444	RT	TH	577	0	37	RT	TH
TH	158	124	LT	TH	RT	TH	515	42	RT	TH	TH
RT	124	35	RT	TH	RT	TH	515	42	RT	TH	TH
RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	TH
6	1856	10	2871	108	RT	TH	556	33	43	0	37
LT	TH	RT	LT	TH	RT	TH	556	33	43	0	37
RT	TH	LT	RT	TH	LT	RT	TH	556	33	43	0
0	1842	21	3	96	LT	RT	TH	556	33	43	0
TH	1842	21	3	96	LT	RT	TH	556	33	43	0
RT	TH	LT	RT	TH	LT	RT	TH	556	33	43	0
43	1891	33	53	LT	RT	TH	556	33	43	0	37
LT	40	96	3042	138	RT	TH	556	33	43	0	37
TH	20	34	LT	TH	RT	TH	556	33	43	0	37
RT	TH	LT	RT	TH	LT	RT	TH	556	33	43	0
185	1404	514	299	LT	RT	TH	556	33	43	0	37
LT	532	433	2271	228	RT	TH	556	33	43	0	37
TH	473	137	LT	TH	RT	TH	556	33	43	0	37
RT	TH	LT	RT	TH	LT	RT	TH	556	33	43	0

Liberty Rd

Drive 2

Bunker Lane

Sawmill Dr

Drive 1

Big Bear Ave

Powell Rd

Off site consists of Day care and office

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2036 Full build with proposed access										PM Peak Hour g1=g+d5																																																	
<table border="1"> <tr> <td>RT 43</td> <td>TH 1281</td> <td>LT 197</td> <td>TH 133</td> <td>RT 174</td> <td>TH 423</td> <td>LT 197</td> <td>TH 133</td> <td>RT 43</td> <td>TH 1281</td> </tr> <tr> <td>LT 85</td> <td>TH 160</td> <td>RT 126</td> <td>TH 160</td> <td>LT 126</td> <td>TH 160</td> <td>RT 126</td> <td>TH 160</td> <td>LT 126</td> <td>TH 160</td> </tr> </table>										RT 43	TH 1281	LT 197	TH 133	RT 174	TH 423	LT 197	TH 133	RT 43	TH 1281	LT 85	TH 160	RT 126	TH 160	LT 126	TH 160	RT 126	TH 160	LT 126	TH 160	<table border="1"> <tr> <td>RT 21</td> <td>TH 1</td> <td>LT 25</td> <td>TH 1</td> <td>LT 25</td> <td>TH 1</td> <td>LT 25</td> <td>TH 1</td> <td>RT 21</td> <td>TH 1</td> </tr> <tr> <td>TH 521</td> <td>RT 70</td> <td>TH 521</td> <td>RT 70</td> <td>TH 521</td> <td>RT 70</td> <td>TH 521</td> <td>RT 70</td> <td>TH 521</td> <td>RT 70</td> </tr> </table>										RT 21	TH 1	LT 25	TH 1	LT 25	TH 1	LT 25	TH 1	RT 21	TH 1	TH 521	RT 70	TH 521	RT 70	TH 521	RT 70	TH 521	RT 70	TH 521	RT 70
RT 43	TH 1281	LT 197	TH 133	RT 174	TH 423	LT 197	TH 133	RT 43	TH 1281																																																		
LT 85	TH 160	RT 126	TH 160	LT 126	TH 160	RT 126	TH 160	LT 126	TH 160																																																		
RT 21	TH 1	LT 25	TH 1	LT 25	TH 1	LT 25	TH 1	RT 21	TH 1																																																		
TH 521	RT 70	TH 521	RT 70	TH 521	RT 70	TH 521	RT 70	TH 521	RT 70																																																		
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RT 6	TH 1890	LT 0	TH 1890	LT 0	TH 1890	LT 0	TH 1890	LT 0	TH 1890																																																		
LT 0	TH 1890	RT 10	TH 1890	LT 0	TH 1890	RT 10	TH 1890	LT 0	TH 1890																																																		
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RT 0	TH 1860	LT 37	TH 1860	LT 37	TH 1860	LT 37	TH 1860	LT 37	TH 1860																																																		
LT 5	TH 2	RT 8	LT 5	TH 2	RT 8	LT 5	TH 2	RT 8	LT 5																																																		
RT 19	TH 15	LT 53	TH 19	TH 15	LT 53	TH 19	TH 15	LT 53	TH 19																																																		
LT 40	TH 20	RT 34	LT 40	TH 20	RT 34	LT 40	TH 20	RT 34	LT 40																																																		
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RT 194	TH 1480	LT 520	TH 194	TH 1480	LT 520	TH 194	TH 1480	LT 520	TH 194																																																		
LT 537	TH 473	RT 137	LT 537	TH 473	RT 137	LT 537	TH 473	RT 137	LT 537																																																		
RT 197	TH 389	LT 299	TH 197	TH 389	LT 299	TH 197	TH 389	LT 299	TH 197																																																		
LT 537	TH 473	RT 137	LT 537	TH 473	RT 137	LT 537	TH 473	RT 137	LT 537																																																		
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RT 197	TH 389	LT 299	TH 197	TH 389	LT 299	TH 197	TH 389	LT 299	TH 197																																																		
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RT 197	TH 389	LT 299	TH 197	TH 389	LT 299	TH 197	TH 389	LT 299	TH 197																																																		
LT 537	TH 473	RT 137	LT 537	TH 473	RT 137	LT 537	TH 473	RT 137	LT 537																																																		
RT 197	TH 389	LT 299	TH 197	TH 389	LT 299	TH 197	TH 389	LT 299	TH 197																																																		
LT 537	TH 473	RT 137	LT 537	TH 473	RT 137	LT 537	TH 473	RT 137	LT 537																																																		



A legacy of **experience**. A reputation for **excellence**.

APPENDIX C:

Signal Warrant Analyses

SIGNAL WARRANT WORKSHEET
OMUTCD Warrant 1
Liberty Road & Seldom Seen Road

2016 Background Traffic - No RT Reduction

CONDITION	# OF LANES	LIBERTY RD			SELDOM SEEN RD			Condition A				Condition B			
		1-WAY	1-WAY	2-WAY	1-WAY	1-WAY	1-WAY	MAJ	MIN	MAJ	MIN	MAJ	MIN	MAJ	MIN
Standard	1			X			X	500	150	400	120	750	75	600	60
Standard	2+							600	200	480	160	900	100	720	80
High Speed	1							350	105	280	84	525	53	420	42
High Speed	2+							420	140	336	112	630	70	504	56
7-8 AM		434	490	924	202		202	YES	YES	YES	YES	YES	YES	YES	YES
8-9 AM		346	391	737	196		196	YES	YES	YES	YES	NO	YES	YES	YES
9-10 AM		300	281	580	151		151	YES	YES	YES	YES	NO	YES	NO	YES
10-11 AM		224	244	468	163		163	NO	YES	YES	YES	NO	YES	NO	YES
11-12 NOON		240	266	506	145		145	YES	NO	YES	YES	NO	YES	NO	YES
12-1 PM		250	222	472	152		152	NO	YES	YES	YES	NO	YES	NO	YES
1-2 PM		260	247	507	196		196	YES	YES	YES	YES	NO	YES	NO	YES
2-3 PM		315	316	631	194		194	YES	YES	YES	YES	NO	YES	YES	YES
3-4 PM		485	360	845	243		243	YES	YES	YES	YES	YES	YES	YES	YES
4-5 PM		562	409	971	254		254	YES	YES	YES	YES	YES	YES	YES	YES
5-6 PM		659	409	1068	322		322	YES	YES	YES	YES	YES	YES	YES	YES
6-7 PM		554	378	932	294		294	YES	YES	YES	YES	YES	YES	YES	YES
7-8 PM		388	239	627	247		247	YES	YES	YES	YES	NO	YES	YES	YES
Hours Met								11	12	13	13	5	13	8	13
Hours Warrant Met								10		13		5		8	
Warrant Satisfied ?								YES		YES		NO		YES	

Condition A : MET
Condition B : NOT MET
80% of Condition A and B : NOT APPLICABLE

Year 2012 Hourly volumes at Seldom Seen Road/Liberty Road			
Hour	Northbound	Southbound	Eastbound
7am-8am	385	440	175
8am-9am	307	351	170
9am-10am	266	252	131
10am-11am	199	219	141
11am-noon	213	239	126
noon-1pm	221	196	134
1pm-2pm	230	218	173
2pm-3pm	278	279	171
3pm-4pm	428	318	214
4pm-5pm	496	361	224
5pm-6pm	582	361	284
6pm-7pm	489	334	259
7pm-8pm	343	211	218

Projected Year 2016 No-Build Hourly volumes at Seldom Seen Road/Liberty Road			
Hour	Northbound	Southbound	Eastbound
7am-8am	434	490	202
8am-9am	346	391	196
9am-10am	300	281	151
10am-11am	224	244	163
11am-noon	240	266	145
noon-1pm	250	222	152
1pm-2pm	260	247	196
2pm-3pm	315	316	194
3pm-4pm	485	360	243
4pm-5pm	562	409	254
5pm-6pm	659	409	322
6pm-7pm	554	378	294
7pm-8pm	388	239	247

SIGNAL WARRANT WORKSHEET

Warrant 1 Seldom Seen Road & Bunker Drive

2016 BUILD - Estimated 8th High Hour (2-3PM): Not met

CONDITION	# OF LANES	SELDOM SEEN RD			BUNKER DRIVE			Condition A				Condition B			
		1-WAY	1-WAY	2-WAY	1-WAY	1-WAY	1-WAY	MAJ	MIN	MAJ	MIN	MAJ	MIN	MAJ	MIN
Standard	1							500	150	400	120	750	75	600	60
Standard	2+							600	200	480	160	900	100	720	80
High Speed	1			X			X	350	105	280	84	525	53	420	42
High Speed	2+							420	140	336	112	630	70	504	56
7-8 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
8-9 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
9-10 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
10-11 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
11-12 NOON							0	NO	NO	NO	NO	NO	NO	NO	NO
12-1 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
1-2 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
2-3 PM		246	244	490	49		49	YES	NO	YES	NO	NO	NO	YES	YES
3-4 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
4-5 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
5-6 PM		415	412	827	83		83	YES	NO	YES	NO	YES	YES	YES	YES
6-7 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
7-8 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
Based on hourly variation at Seldom Seen/Liberty								2	0	2	0	1	1	2	2
59.30%								0		0		1		2	
Hours Met								Hours Warrant Met							
Warrant Satisfied ?								Warrant Satisfied ?							

Condition A : NOT MET
 Condition B : NOT MET
 80% of Condition A and B : NOT MET

SIGNAL WARRANT WORKSHEET

Warrant 1 Seldom Seen Road & Bunker Drive

2036 BUILD - Estimated 8th High Hour (2-3PM): NOT MET

CONDITION	# OF LANES	SELDOM SEEN RD			BUNKER DRIVE			Condition A				Condition B			
		1-WAY	1-WAY	2-WAY	1-WAY	1-WAY	1-WAY	MAJ	MIN	MAJ	MIN	MAJ	MIN	MAJ	MIN
Standard	1							500	150	400	120	750	75	600	60
Standard	2+							600	200	480	160	900	100	720	80
High Speed	1			X			X	350	105	280	84	525	53	420	42
High Speed	2+							420	140	336	112	630	70	504	56
7-8 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
8-9 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
9-10 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
10-11 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
11-12 NOON							0	NO	NO	NO	NO	NO	NO	NO	NO
12-1 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
1-2 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
2-3 PM		370	365	735	49		49	YES	NO	YES	NO	YES	NO	YES	YES
3-4 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
4-5 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
5-6 PM		624	616	1240	83		83	YES	NO	YES	NO	YES	YES	YES	YES
6-7 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
7-8 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
Based on hourly variation at Seldom Seen/Liberty								2	0	2	0	2	1	2	2
59.30%								0		0		1		2	
Hours Met								NO		NO		NO		NO	
Hours Warrant Met															
Warrant Satisfied ?															

Condition A : NOT MET
Condition B : NOT MET
80% of Condition A and B : NOT MET

SIGNAL WARRANT WORKSHEET

Warrant 1 Seldom Seen Road & Bunker Drive

2036 BACKGROUND - Estimated 8th High Hour (2-3PM): NOT MET

CONDITION	# OF LANES	SELDOM SEEN RD			BUNKER DRIVE			Condition A				Condition B			
		1-WAY	1-WAY	2-WAY	1-WAY	1-WAY	1-WAY	MAJ	MIN	MAJ	MIN	MAJ	MIN	MAJ	MIN
Standard	1							500	150	400	120	750	75	600	60
Standard	2+							600	200	480	160	900	100	720	80
High Speed	1			X			X	350	105	280	84	525	53	420	42
High Speed	2+							420	140	336	112	630	70	504	56
7-8 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
8-9 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
9-10 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
10-11 AM							0	NO	NO	NO	NO	NO	NO	NO	NO
11-12 NOON							0	NO	NO	NO	NO	NO	NO	NO	NO
12-1 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
1-2 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
2-3 PM		365	345	710	47		47	YES	NO	YES	NO	YES	NO	YES	YES
3-4 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
4-5 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
5-6 PM		615	582	1197	80		80	YES	NO	YES	NO	YES	YES	YES	YES
6-7 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
7-8 PM							0	NO	NO	NO	NO	NO	NO	NO	NO
Based on hourly variation at Seldom Seen/Liberty								2	0	2	0	2	1	2	2
59.30%								0		0		1		2	
Hours Met								NO		NO		NO		NO	
Hours Warrant Met															
Warrant Satisfied ?															

Condition A : NOT MET
Condition B : NOT MET
80% of Condition A and B : NOT MET

Warrant 1
Sawmill Parkway & Drive 1

CONDITION	# OF LANES	SAWMILL PARKWAY			DRIVE 1			Condition A				Condition B				
		1-WAY	1-WAY	2-WAY	1-WAY	1-WAY	1-WAY	MAJ	MIN	MAJ	MIN	MAJ	MIN	MAJ	MIN	
Standard	1							500	150	400	80%	80%	750	75	600	80%
Standard	2+							600	200	480	160		900	100	720	80
High Speed	1						X	350	105	280	84		525	53	420	42
High Speed	2+			X				420	140	336	112		630	70	504	56
7-8 AM							0	NO	NO	NO	NO		NO	NO	NO	NO
8-9 AM							0	NO	NO	NO	NO		NO	NO	NO	NO
9-10 AM							0	NO	NO	NO	NO		NO	NO	NO	NO
10-11 AM							0	NO	NO	NO	NO		NO	NO	NO	NO
11-12 NOON							0	NO	NO	NO	NO		NO	NO	NO	NO
12-1 PM							0	NO	NO	NO	NO		NO	NO	NO	NO
1-2 PM							0	NO	NO	NO	NO		NO	NO	NO	NO
2-3 PM		1081.632	639	1721	54		54	YES	NO	YES	NO		YES	YES	YES	YES
3-4 PM							0	NO	NO	NO	NO		NO	NO	NO	NO
4-5 PM							0	NO	NO	NO	NO		NO	NO	NO	NO
5-6 PM		1824	1078	2902	91		91	YES	NO	YES	YES		YES	YES	YES	YES
6-7 PM							0	NO	NO	NO	NO		NO	NO	NO	NO
7-8 PM							0	NO	NO	NO	NO		NO	NO	NO	NO
Based on hourly variation at Seldom Seen/Liberty								2	0	2	1	2	2	2	2	
59.3%								0		1		2		2		
Hours Met								NO		NO		NO		NO		
Hours Warrant Met																
Warrant Satisfied ?																

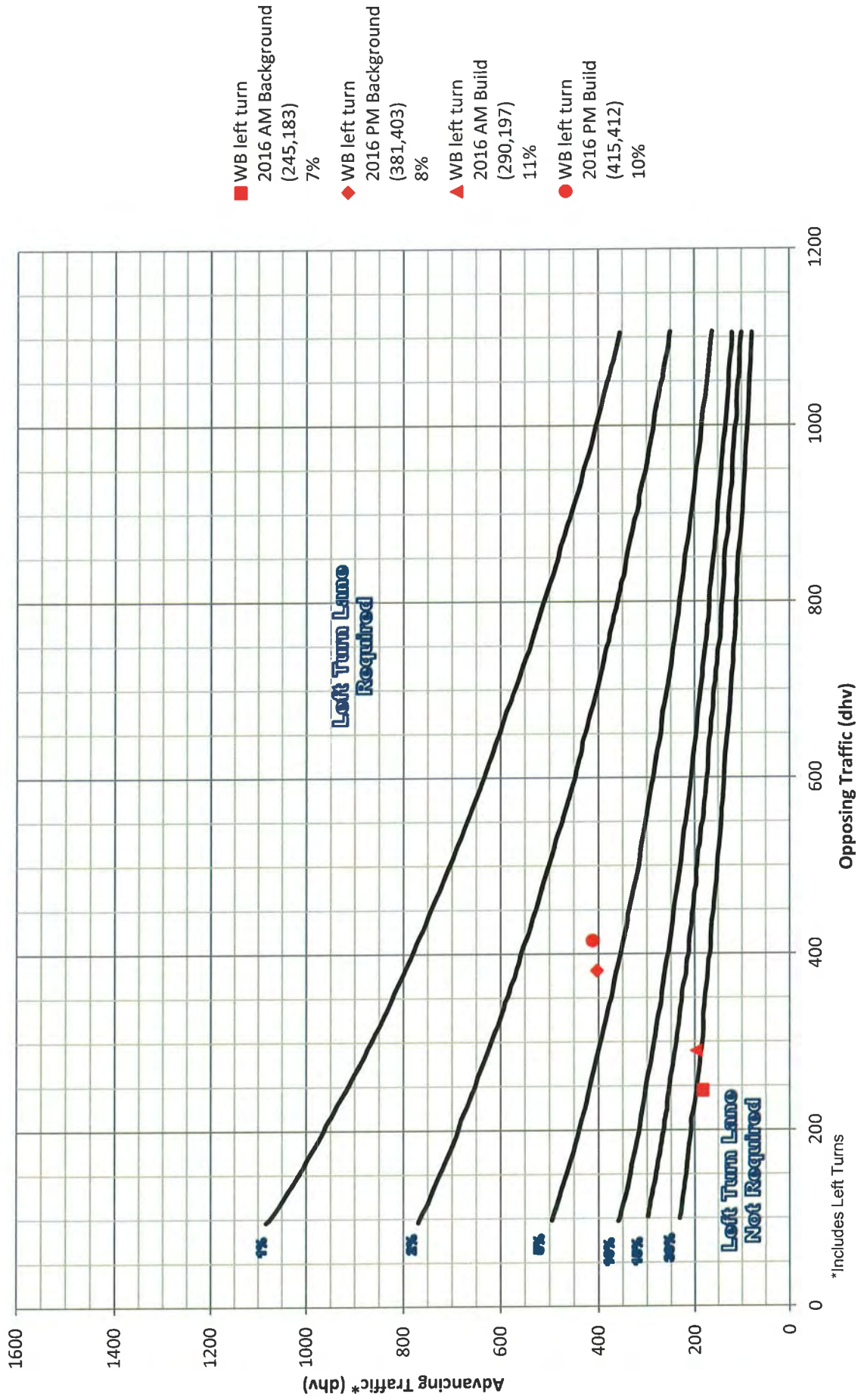


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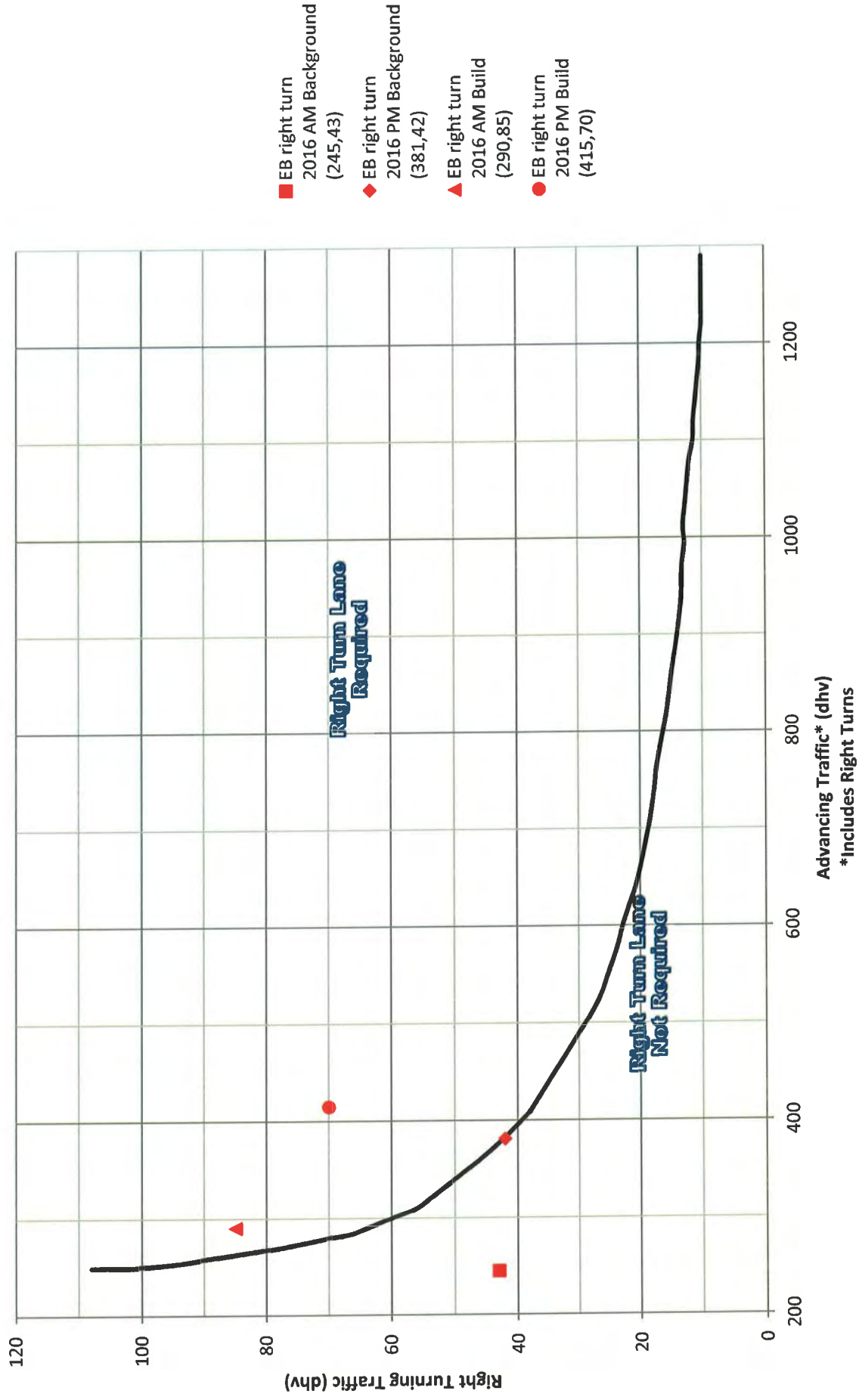
APPENDIX D:

Turn Lane Warrants / Length Calculations

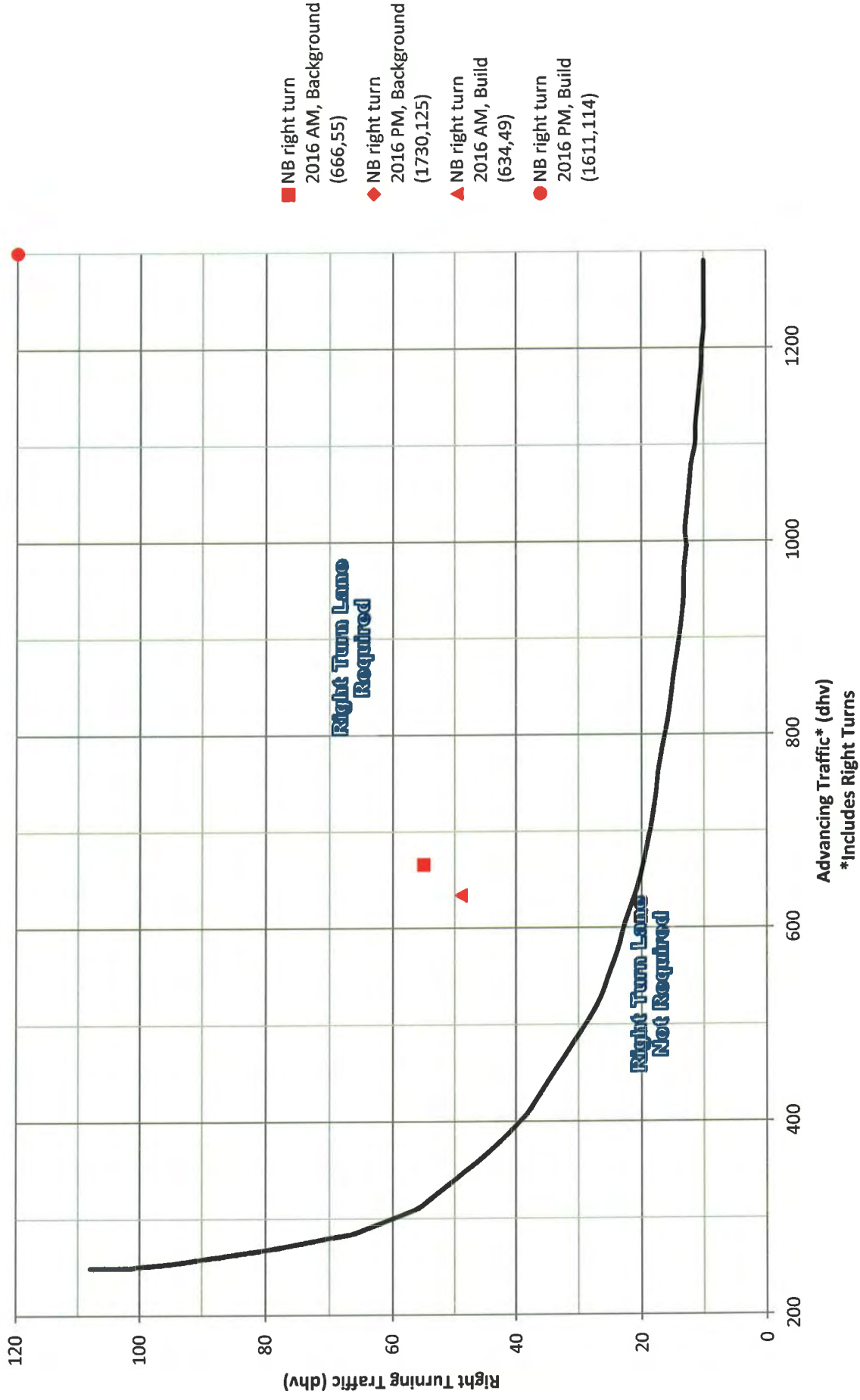
Seldom Seen Road @ Bunker Lane
2-Lane Highway Left Turn Lane Warrant
 >40 mph or 70 kph Posted Speed



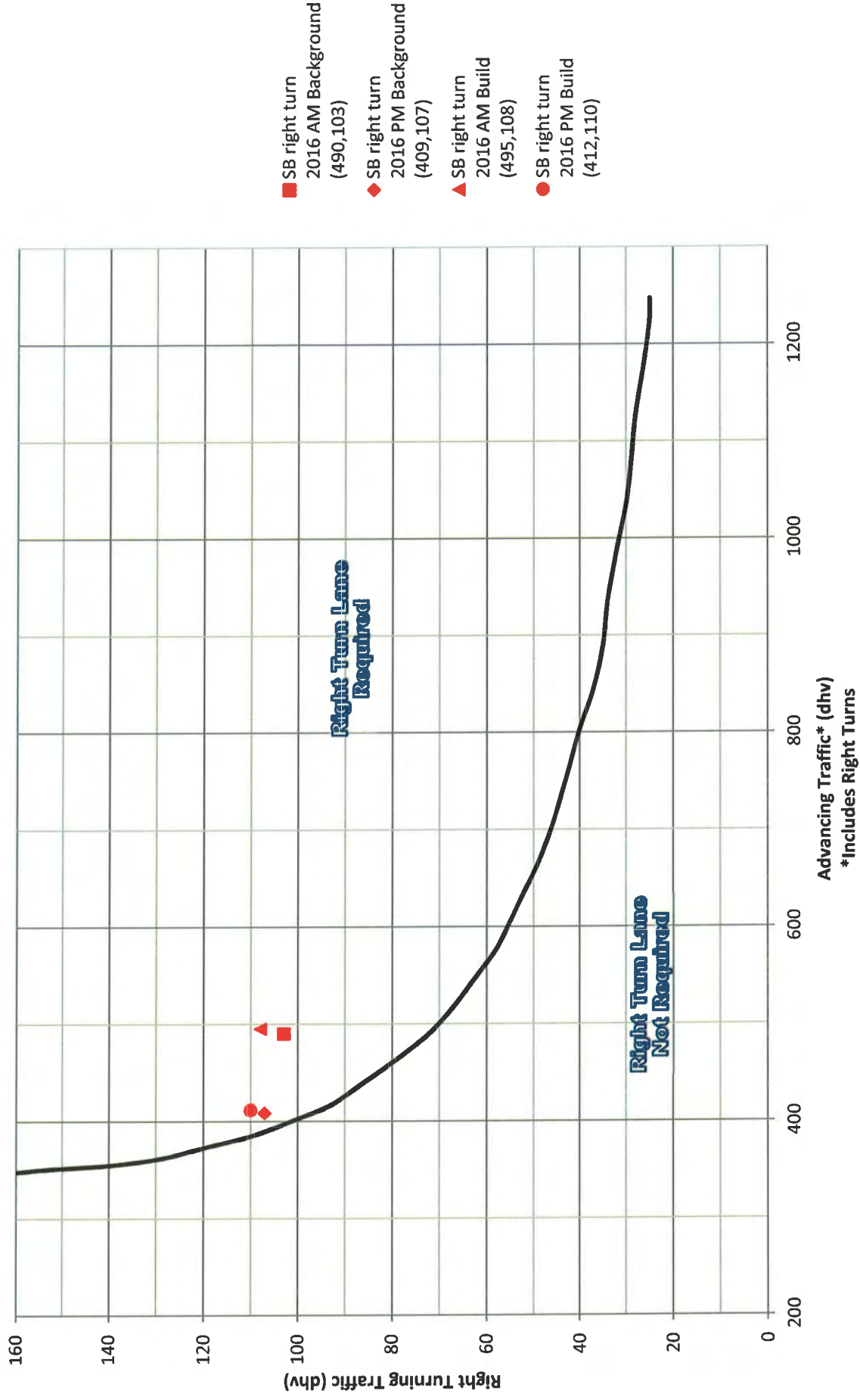
Seldom Seen Road @ Bunker Lane
2-Lane Highway Right Turn Lane Warrant
 >40 mph or 70 kph Posted Speed



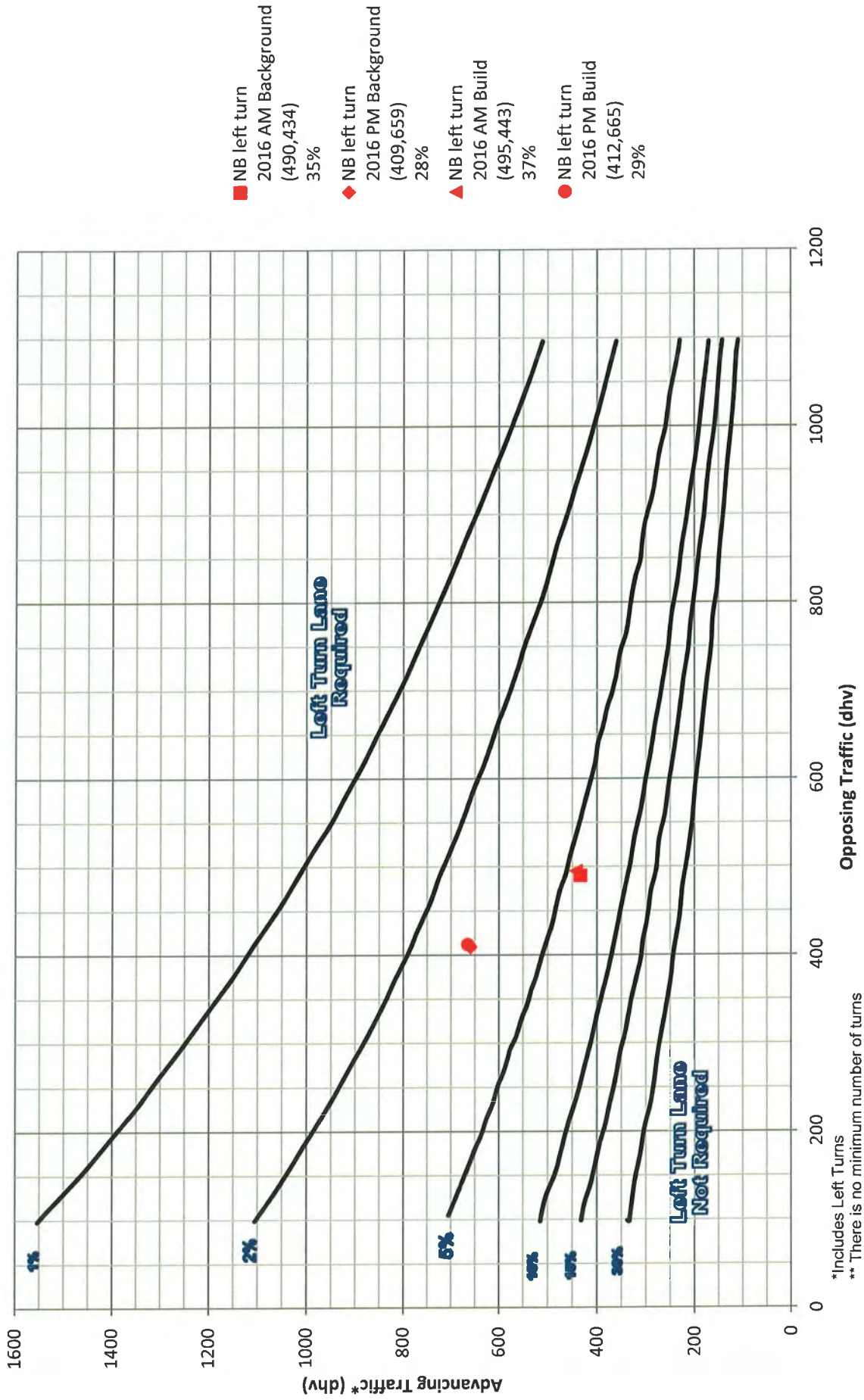
Sawmill Parkway @ Sawmill Drive
2-Lane Highway Right Turn Lane Warrant
 >40 mph or 70 kph Posted Speed



Seldom Seen Road @ Liberty Road
2-Lane Highway Right Turn Lane Warrant
 =<40 mph or 70 kph Posted Speed



Seldom Seen Road @ Liberty Road
2-Lane Highway Left Turn Lane Warrant
 =<40 mph or 70 kph Posted Speed



**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	318	vph	
Number of Through Lanes	2		
Turning Volume	164	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	34%		
Vehicles Per Cycle	2.3		
Storage Length	100	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	175	feet	
No Block Turn Lane Length	225	feet	

PM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	473	vph	
Number of Through Lanes	2		
Turning Volume	532	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	53%		
Vehicles Per Cycle	8.9		
Storage Length	350	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	475	feet	
No Block Distance	325	feet	
No Block Turn Lane Length	475	feet	

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	318	vph	
Number of Through Lanes	2		
Turning Volume	172	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	35%		
Vehicles Per Cycle	2.4		
Storage Length	100	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	175	feet	
No Block Turn Lane Length	225	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	473	vph	
Number of Through Lanes	2		
Turning Volume	540	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	53%		
Vehicles Per Cycle	9.0		
Storage Length	350	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	475	feet	
No Block Distance	325	feet	
No Block Turn Lane Length	475	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBRT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	954	vph	
Number of Through Lanes	2		
Turning Volume	127	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	3.5		
Storage Length	175	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	300	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

AM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBRT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	987	vph	
Number of Through Lanes	2		
Turning Volume	131	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	3.6		
Storage Length	175	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	300	feet	
No Block Distance	500	feet	
No Block Turn Lane Length	500	feet	

PM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBRT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	771	vph	
Number of Through Lanes	2		
Turning Volume	102	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	3.4		
Storage Length	150	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	275	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

PM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBRT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	847	vph	
Number of Through Lanes	2		
Turning Volume	111	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	3.7		
Storage Length	175	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	300	feet	
No Block Distance	500	feet	
No Block Turn Lane Length	500	feet	

Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations

AM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBRT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1701	vph	
Number of Through Lanes	2		
Turning Volume	228	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	6.3		
Storage Length	250	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	375	feet	
No Block Distance	800	feet	
No Block Turn Lane Length	800	feet	

PM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBRT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1404	vph	
Number of Through Lanes	2		
Turning Volume	185	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	6.2		
Storage Length	250	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	375	feet	
No Block Distance	775	feet	
No Block Turn Lane Length	775	feet	

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBRT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1734	vph	
Number of Through Lanes	2		
Turning Volume	232	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	6.4		
Storage Length	250	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	375	feet	
No Block Distance	800	feet	
No Block Turn Lane Length	800	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBRT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1480	vph	
Number of Through Lanes	2		
Turning Volume	194	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	6.5		
Storage Length	275	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	400	feet	
No Block Distance	825	feet	
No Block Turn Lane Length	825	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	954	vph	
Number of Through Lanes	2		
Turning Volume	199	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	17%		
Vehicles Per Cycle	2.8		
Storage Length	150	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	275	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

PM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	771	vph	
Number of Through Lanes	2		
Turning Volume	284	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	27%		
Vehicles Per Cycle	4.7		
Storage Length	200	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

AM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	987	vph	
Number of Through Lanes	2		
Turning Volume	202	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	17%		
Vehicles Per Cycle	2.8		
Storage Length	150	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	275	feet	
No Block Distance	500	feet	
No Block Turn Lane Length	500	feet	

PM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	847	vph	
Number of Through Lanes	2		
Turning Volume	290	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	26%		
Vehicles Per Cycle	4.8		
Storage Length	200	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	500	feet	
No Block Turn Lane Length	500	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1701	vph	
Number of Through Lanes	2		
Turning Volume	358	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	17%		
Vehicles Per Cycle	5.0		
Storage Length	200	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	800	feet	
No Block Turn Lane Length	800	feet	

PM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1404	vph	
Number of Through Lanes	2		
Turning Volume	514	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	27%		
Vehicles Per Cycle	8.6		
Storage Length	350	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	475	feet	
No Block Distance	775	feet	
No Block Turn Lane Length	775	feet	

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1734	vph	
Number of Through Lanes	2		
Turning Volume	361	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	17%		
Vehicles Per Cycle	5.0		
Storage Length	200	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	800	feet	
No Block Turn Lane Length	800	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Powell Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1480	vph	
Number of Through Lanes	2		
Turning Volume	520	vph	
Number of Turning Lanes	2		
Design Condition	C	A, B, or C	
Turning Percentage	26%		
Vehicles Per Cycle	8.7		
Storage Length	350	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	475	feet	
No Block Distance	825	feet	
No Block Turn Lane Length	825	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Drive 1			
Movement	NBRT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1178	vph	
Number of Through Lanes	2		
Turning Volume	74	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	6%		
Vehicles Per Cycle	2.1		
Storage Length	100	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	550	feet	
No Block Turn Lane Length	550	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Drive 1			
Movement	NBRT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	3096	vph	
Number of Through Lanes	2		
Turning Volume	55	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	2%		
Vehicles Per Cycle	1.8		
Storage Length	100	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	1550	feet	
No Block Turn Lane Length	1550	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Drive 1			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1182	vph	
Number of Through Lanes	2		
Turning Volume	42	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	3%		
Vehicles Per Cycle	1.2		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	550	feet	
No Block Turn Lane Length	550	feet	

PM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Drive 1			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1042	vph	
Number of Through Lanes	2		
Turning Volume	36	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	3%		
Vehicles Per Cycle	1.2		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	600	feet	
No Block Turn Lane Length	600	feet	

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Drive 1			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	2117	vph	
Number of Through Lanes	2		
Turning Volume	56	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	3%		
Vehicles Per Cycle	1.6		
Storage Length	100	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	975	feet	
No Block Turn Lane Length	975	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Drive 1			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1860	vph	
Number of Through Lanes	2		
Turning Volume	40	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	2%		
Vehicles Per Cycle	1.3		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	975	feet	
No Block Turn Lane Length	975	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour

2016 with Site traffic

Sawmill Parkway & Drive 1			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	652	vph	
Number of Through Lanes	2		
Turning Volume	16	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	2%		
Vehicles Per Cycle	0.4		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	350	feet	
No Block Turn Lane Length	350	feet	

PM Peak Hour

2016 with Site traffic

Sawmill Parkway & Drive 1			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1716	vph	
Number of Through Lanes	2		
Turning Volume	35	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	2%		
Vehicles Per Cycle	1.2		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	975	feet	
No Block Turn Lane Length	975	feet	

AM Peak Hour

2036 with Site traffic

Sawmill Parkway & Drive 1			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1165	vph	
Number of Through Lanes	2		
Turning Volume	16	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	1%		
Vehicles Per Cycle	0.4		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	550	feet	
No Block Turn Lane Length	550	feet	

PM Peak Hour

2036 with Site traffic

Sawmill Parkway & Drive 1			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	3095	vph	
Number of Through Lanes	2		
Turning Volume	35	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	1%		
Vehicles Per Cycle	1.2		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	1550	feet	
No Block Turn Lane Length	1550	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Sawmill Drive			
Movement	NBRT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	1126	vph	
Number of Through Lanes	2		
Turning Volume	54	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	5%		
Vehicles Per Cycle	0.9		
Storage Length	50	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Sawmill Drive			
Movement	NBRT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	2899	vph	
Number of Through Lanes	2		
Turning Volume	117	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	4%		
Vehicles Per Cycle	2.0		
Storage Length	100	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	513	vph	
Number of Through Lanes	2		
Turning Volume	29	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	5%		
Vehicles Per Cycle	0.8		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	275	feet	
No Block Turn Lane Length	275	feet	

PM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1269	vph	
Number of Through Lanes	2		
Turning Volume	89	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	7%		
Vehicles Per Cycle	3.0		
Storage Length	150	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	275	feet	
No Block Distance	725	feet	
No Block Turn Lane Length	725	feet	

AM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	522	vph	
Number of Through Lanes	2		
Turning Volume	30	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	5%		
Vehicles Per Cycle	0.8		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	275	feet	
No Block Turn Lane Length	275	feet	

PM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1289	vph	
Number of Through Lanes	2		
Turning Volume	92	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	7%		
Vehicles Per Cycle	3.1		
Storage Length	150	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	275	feet	
No Block Distance	725	feet	
No Block Turn Lane Length	725	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	920	vph	
Number of Through Lanes	2		
Turning Volume	51	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	5%		
Vehicles Per Cycle	1.4		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	929	vph	
Number of Through Lanes	2		
Turning Volume	52	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	5%		
Vehicles Per Cycle	1.4		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

PM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	2302	vph	
Number of Through Lanes	2		
Turning Volume	160	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	6%		
Vehicles Per Cycle	5.3		
Storage Length	200	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	1250	feet	
No Block Turn Lane Length	1250	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	NBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	2322	vph	
Number of Through Lanes	2		
Turning Volume	163	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	7%		
Vehicles Per Cycle	5.4		
Storage Length	200	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	1250	feet	
No Block Turn Lane Length	1250	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	938	vph	
Number of Through Lanes	2		
Turning Volume	62	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	6%		
Vehicles Per Cycle	1.7		
Storage Length	100	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

PM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	708	vph	
Number of Through Lanes	2		
Turning Volume	104	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	13%		
Vehicles Per Cycle	3.5		
Storage Length	175	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	300	feet	
No Block Distance	450	feet	
No Block Turn Lane Length	450	feet	

AM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	954	vph	
Number of Through Lanes	2		
Turning Volume	77	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	7%		
Vehicles Per Cycle	2.1		
Storage Length	100	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

PM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	719	vph	
Number of Through Lanes	2		
Turning Volume	114	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	14%		
Vehicles Per Cycle	3.8		
Storage Length	175	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	300	feet	
No Block Distance	450	feet	
No Block Turn Lane Length	450	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1688	vph	
Number of Through Lanes	2		
Turning Volume	112	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	6%		
Vehicles Per Cycle	3.1		
Storage Length	150	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	275	feet	
No Block Distance	775	feet	
No Block Turn Lane Length	775	feet	

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1704	vph	
Number of Through Lanes	2		
Turning Volume	127	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	7%		
Vehicles Per Cycle	3.5		
Storage Length	175	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	300	feet	
No Block Distance	800	feet	
No Block Turn Lane Length	800	feet	

PM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1270	vph	
Number of Through Lanes	2		
Turning Volume	187	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	13%		
Vehicles Per Cycle	6.2		
Storage Length	250	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	375	feet	
No Block Distance	725	feet	
No Block Turn Lane Length	725	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	SBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	1281	vph	
Number of Through Lanes	2		
Turning Volume	197	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	13%		
Vehicles Per Cycle	6.6		
Storage Length	275	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	400	feet	
No Block Distance	725	feet	
No Block Turn Lane Length	725	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	28	vph	
Number of Through Lanes	1		
Turning Volume	159	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	85%		
Vehicles Per Cycle	4.4		
Storage Length	175	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	300	feet	
No Block Distance	0	feet	
No Block Turn Lane Length	300	feet	

PM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	79	vph	
Number of Through Lanes	1		
Turning Volume	245	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	76%		
Vehicles Per Cycle	8.2		
Storage Length	325	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	450	feet	
No Block Distance	150	feet	
No Block Turn Lane Length	450	feet	

AM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	29	vph	
Number of Through Lanes	1		
Turning Volume	177	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	86%		
Vehicles Per Cycle	4.9		
Storage Length	200	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	0	feet	
No Block Turn Lane Length	325	feet	

PM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	82	vph	
Number of Through Lanes	1		
Turning Volume	266	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	76%		
Vehicles Per Cycle	8.9		
Storage Length	350	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	475	feet	
No Block Distance	150	feet	
No Block Turn Lane Length	475	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	45	vph	
Number of Through Lanes	1		
Turning Volume	260	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	85%		
Vehicles Per Cycle	7.2		
Storage Length	275	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	400	feet	
No Block Distance	50	feet	
No Block Turn Lane Length	400	feet	

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	46	vph	
Number of Through Lanes	1		
Turning Volume	278	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	86%		
Vehicles Per Cycle	7.7		
Storage Length	325	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	450	feet	
No Block Distance	50	feet	
No Block Turn Lane Length	450	feet	

PM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	130	vph	
Number of Through Lanes	1		
Turning Volume	402	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	76%		
Vehicles Per Cycle	13.4		
Storage Length	475	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	600	feet	
No Block Distance	175	feet	
No Block Turn Lane Length	600	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	133	vph	
Number of Through Lanes	1		
Turning Volume	423	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	76%		
Vehicles Per Cycle	14.1		
Storage Length	500	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	625	feet	
No Block Distance	175	feet	
No Block Turn Lane Length	625	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	61	vph	
Number of Through Lanes	1		
Turning Volume	29	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	32%		
Vehicles Per Cycle	0.8		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	100	feet	
No Block Turn Lane Length	175	feet	

PM Peak Hour			
2016 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	97	vph	
Number of Through Lanes	1		
Turning Volume	52	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	35%		
Vehicles Per Cycle	1.7		
Storage Length	100	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	150	feet	
No Block Turn Lane Length	225	feet	

AM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	64	vph	
Number of Through Lanes	1		
Turning Volume	29	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	31%		
Vehicles Per Cycle	0.8		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	100	feet	
No Block Turn Lane Length	175	feet	

PM Peak Hour			
2016 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	99	vph	
Number of Through Lanes	1		
Turning Volume	52	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	34%		
Vehicles Per Cycle	1.7		
Storage Length	100	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	150	feet	
No Block Turn Lane Length	225	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	99	vph	
Number of Through Lanes	1		
Turning Volume	47	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	32%		
Vehicles Per Cycle	1.3		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	150	feet	
No Block Turn Lane Length	175	feet	

AM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	102	vph	
Number of Through Lanes	1		
Turning Volume	47	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	32%		
Vehicles Per Cycle	1.3		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	150	feet	
No Block Turn Lane Length	175	feet	

PM Peak Hour			
2036 w/o Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	158	vph	
Number of Through Lanes	1		
Turning Volume	85	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	35%		
Vehicles Per Cycle	2.8		
Storage Length	150	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	275	feet	
No Block Distance	200	feet	
No Block Turn Lane Length	275	feet	

PM Peak Hour			
2036 with Site traffic			
Sawmill Parkway & Seldom Seen Road			
Movement	EBLT		
Design Speed	45	mph	
Cycle Length	120	seconds	
Control (Stop or Signal)	Signal		
Through Volume	161	vph	
Number of Through Lanes	1		
Turning Volume	85	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	35%		
Vehicles Per Cycle	2.8		
Storage Length	150	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	275	feet	
No Block Distance	200	feet	
No Block Turn Lane Length	275	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	EBRT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	326	vph	
Number of Through Lanes	1		
Turning Volume	47	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	13%		
Vehicles Per Cycle	0.8		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

PM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	EBRT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	542	vph	
Number of Through Lanes	1		
Turning Volume	45	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	8%		
Vehicles Per Cycle	0.8		
Storage Length	50	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

AM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	NBLT		
Design Speed	25	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	24	vph	
Number of Through Lanes	1		
Turning Volume	29	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	55%		
Vehicles Per Cycle	0.5		
Storage Length	50	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	100	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

PM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	NBLT		
Design Speed	25	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	48	vph	
Number of Through Lanes	1		
Turning Volume	83	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	63%		
Vehicles Per Cycle	1.4		
Storage Length	50	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	100	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	170	vph	
Number of Through Lanes	1		
Turning Volume	13	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	7%		
Vehicles Per Cycle	0.2		
Storage Length	50	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

PM Peak Hour			
2016 w/o Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	369	vph	
Number of Through Lanes	1		
Turning Volume	34	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	8%		
Vehicles Per Cycle	0.6		
Storage Length	50	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

AM Peak Hour			
2016 with Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	163	vph	
Number of Through Lanes	1		
Turning Volume	22	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	12%		
Vehicles Per Cycle	0.4		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

PM Peak Hour			
2016 with Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	343	vph	
Number of Through Lanes	1		
Turning Volume	40	vph	
Number of Turning Lanes	1		
Design Condition	C	A, B, or C	
Turning Percentage	10%		
Vehicles Per Cycle	0.7		
Storage Length	50	feet	
Deceleration/Taper	125	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	267	vph	
Number of Through Lanes	1		
Turning Volume	15	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	5%		
Vehicles Per Cycle	0.3		
Storage Length	50	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

PM Peak Hour			
2036 w/o Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	577	vph	
Number of Through Lanes	1		
Turning Volume	42	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	7%		
Vehicles Per Cycle	0.7		
Storage Length	50	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

AM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	264	vph	
Number of Through Lanes	1		
Turning Volume	23	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	8%		
Vehicles Per Cycle	0.4		
Storage Length	50	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

PM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Bunker Lane			
Movement	WBLT		
Design Speed	45	mph	
Cycle Length	60	seconds	
Control (Stop or Signal)	Stop		
Through Volume	559	vph	
Number of Through Lanes	1		
Turning Volume	39	vph	
Number of Turning Lanes	1		
Design Condition	B	A, B, or C	
Turning Percentage	7%		
Vehicles Per Cycle	0.7		
Storage Length	50	feet	
Deceleration/Taper	175	feet	
Calculated Turn Lane Length	175	feet	
No Block Distance	N.A.	feet	
No Block Turn Lane Length	N.A.	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Seldom Seen Road & Liberty Road			
Movement	NBLT		
Design Speed	35	mph	
Cycle Length	90	seconds	
Control (Stop or Signal)	Signal		
Through Volume	280	vph	
Number of Through Lanes	1		
Turning Volume	154	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	35%		
Vehicles Per Cycle	3.9		
Storage Length	175	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	275	feet	
No Block Turn Lane Length	275	feet	

PM Peak Hour			
2016 w/o Site traffic			
Seldom Seen Road & Liberty Road			
Movement	NBLT		
Design Speed	35	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	472	vph	
Number of Through Lanes	1		
Turning Volume	187	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	28%		
Vehicles Per Cycle	5.2		
Storage Length	200	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	250	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

AM Peak Hour			
2016 with Site traffic			
Seldom Seen Road & Liberty Road			
Movement	NBLT		
Design Speed	35	mph	
Cycle Length	90	seconds	
Control (Stop or Signal)	Signal		
Through Volume	280	vph	
Number of Through Lanes	1		
Turning Volume	163	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	37%		
Vehicles Per Cycle	4.1		
Storage Length	175	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	225	feet	
No Block Distance	275	feet	
No Block Turn Lane Length	275	feet	

PM Peak Hour			
2016 with Site traffic			
Seldom Seen Road & Liberty Road			
Movement	NBLT		
Design Speed	35	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	472	vph	
Number of Through Lanes	1		
Turning Volume	193	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	29%		
Vehicles Per Cycle	5.4		
Storage Length	200	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	250	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2016 w/o Site traffic			
Seldom Seen Road & Liberty Road			
Movement	SBRT		
Design Speed	35	mph	
Cycle Length	90	seconds	
Control (Stop or Signal)	Signal		
Through Volume	387	vph	
Number of Through Lanes	1		
Turning Volume	103	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	21%		
Vehicles Per Cycle	2.6		
Storage Length	150	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	200	feet	
No Block Distance	375	feet	
No Block Turn Lane Length	375	feet	

AM Peak Hour			
2016 with Site traffic			
Seldom Seen Road & Liberty Road			
Movement	SBRT		
Design Speed	35	mph	
Cycle Length	90	seconds	
Control (Stop or Signal)	Signal		
Through Volume	387	vph	
Number of Through Lanes	1		
Turning Volume	108	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	22%		
Vehicles Per Cycle	2.7		
Storage Length	150	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	200	feet	
No Block Distance	375	feet	
No Block Turn Lane Length	375	feet	

PM Peak Hour			
2016 w/o Site traffic			
Seldom Seen Road & Liberty Road			
Movement	SBRT		
Design Speed	35	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	302	vph	
Number of Through Lanes	1		
Turning Volume	107	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	26%		
Vehicles Per Cycle	3.0		
Storage Length	150	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	200	feet	
No Block Distance	325	feet	
No Block Turn Lane Length	325	feet	

PM Peak Hour			
2016 with Site traffic			
Seldom Seen Road & Liberty Road			
Movement	SBRT		
Design Speed	35	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	302	vph	
Number of Through Lanes	1		
Turning Volume	112	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	27%		
Vehicles Per Cycle	3.1		
Storage Length	150	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	200	feet	
No Block Distance	325	feet	
No Block Turn Lane Length	325	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Seldom Seen Road & Liberty Road			
Movement	NBLT		
Design Speed	35	mph	
Cycle Length	90	seconds	
Control (Stop or Signal)	Signal		
Through Volume	506	vph	
Number of Through Lanes	1		
Turning Volume	274	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	35%		
Vehicles Per Cycle	6.9		
Storage Length	275	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

PM Peak Hour			
2036 w/o Site traffic			
Seldom Seen Road & Liberty Road			
Movement	NBLT		
Design Speed	35	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	852	vph	
Number of Through Lanes	1		
Turning Volume	336	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	28%		
Vehicles Per Cycle	9.3		
Storage Length	350	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	400	feet	
No Block Distance	800	feet	
No Block Turn Lane Length	800	feet	

AM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Liberty Road			
Movement	NBLT		
Design Speed	35	mph	
Cycle Length	90	seconds	
Control (Stop or Signal)	Signal		
Through Volume	506	vph	
Number of Through Lanes	1		
Turning Volume	283	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	36%		
Vehicles Per Cycle	7.1		
Storage Length	275	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	325	feet	
No Block Distance	475	feet	
No Block Turn Lane Length	475	feet	

PM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Liberty Road			
Movement	NBLT		
Design Speed	35	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	852	vph	
Number of Through Lanes	1		
Turning Volume	342	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	29%		
Vehicles Per Cycle	9.5		
Storage Length	375	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	425	feet	
No Block Distance	800	feet	
No Block Turn Lane Length	800	feet	

**Seldom Seen Senior Living
Traffic Impact Study
Turn Lane Length Calculations**

AM Peak Hour			
2036 w/o Site traffic			
Seldom Seen Road & Liberty Road			
Movement	SBRT		
Design Speed	35	mph	
Cycle Length	90	seconds	
Control (Stop or Signal)	Signal		
Through Volume	699	vph	
Number of Through Lanes	1		
Turning Volume	185	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	21%		
Vehicles Per Cycle	4.6		
Storage Length	200	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	250	feet	
No Block Distance	600	feet	
No Block Turn Lane Length	600	feet	

AM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Liberty Road			
Movement	SBRT		
Design Speed	35	mph	
Cycle Length	90	seconds	
Control (Stop or Signal)	Signal		
Through Volume	699	vph	
Number of Through Lanes	1		
Turning Volume	190	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	21%		
Vehicles Per Cycle	4.8		
Storage Length	200	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	250	feet	
No Block Distance	600	feet	
No Block Turn Lane Length	600	feet	

PM Peak Hour			
2036 w/o Site traffic			
Seldom Seen Road & Liberty Road			
Movement	SBRT		
Design Speed	35	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	545	vph	
Number of Through Lanes	1		
Turning Volume	192	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	26%		
Vehicles Per Cycle	5.3		
Storage Length	200	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	250	feet	
No Block Distance	525	feet	
No Block Turn Lane Length	525	feet	

PM Peak Hour			
2036 with Site traffic			
Seldom Seen Road & Liberty Road			
Movement	SBRT		
Design Speed	35	mph	
Cycle Length	100	seconds	
Control (Stop or Signal)	Signal		
Through Volume	545	vph	
Number of Through Lanes	1		
Turning Volume	195	vph	
Number of Turning Lanes	1		
Design Condition	A	A, B, or C	
Turning Percentage	26%		
Vehicles Per Cycle	5.4		
Storage Length	200	feet	
Deceleration/Taper	50	feet	
Calculated Turn Lane Length	250	feet	
No Block Distance	525	feet	
No Block Turn Lane Length	525	feet	



A legacy of **experience**. A reputation for **excellence**.

APPENDIX E:

Capacity Analysis Reports
Year 2016



A legacy of **experience**. A reputation for **excellence**.

2016 AM Peak Hour
No Build

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	192	43	13	158	12	29	1	18	8	2	13
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	175	-	-	125	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	11	206	46	14	170	13	31	1	19	9	2	14












Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	185	0	0	253	0	0	465	464	230	467	480	179
Stage 1	-	-	-	-	-	-	251	251	-	206	206	-
Stage 2	-	-	-	-	-	-	214	213	-	261	274	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1396	-	-	1318	-	-	511	498	814	509	488	869
Stage 1	-	-	-	-	-	-	758	703	-	801	735	-
Stage 2	-	-	-	-	-	-	793	730	-	748	687	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1395	-	-	1318	-	-	494	488	814	488	478	867
Mov Cap-2 Maneuver	-	-	-	-	-	-	494	488	-	488	478	-
Stage 1	-	-	-	-	-	-	752	697	-	793	726	-
Stage 2	-	-	-	-	-	-	769	721	-	723	682	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.6	11.6	10.7
HCM LOS	B	B	B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	494	786	1395	-	-	1318	-	-	488	782
HCM Lane V/C Ratio	0.063	0.026	0.008	-	-	0.011	-	-	0.018	0.021
HCM Control Delay (s)	12.8	9.7	7.6	-	-	7.8	-	-	12.5	9.7
HCM Lane LOS	B	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	0	-	-	0.1	0.1
























HCM 2010 Signalized Intersection Summary
7: Liberty Rd & Seldom Seen Rd

5/1/2015

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	28	174	154	280	387	103		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1845	1900		
Adj Flow Rate, veh/h	30	187	166	301	416	111		
Adj No. of Lanes	1	1	1	1	1	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	2	2	3	3		
Cap, veh/h	260	232	590	1297	977	261		
Arrive On Green	0.15	0.15	0.70	0.70	0.70	0.70		
Sat Flow, veh/h	1774	1583	872	1863	1404	375		
Grp Volume(v), veh/h	30	187	166	301	0	527		
Grp Sat Flow(s),veh/h/ln	1774	1583	872	1863	0	1779		
Q Serve(g_s), s	1.1	8.7	7.7	4.5	0.0	9.7		
Cycle Q Clear(g_c), s	1.1	8.7	17.5	4.5	0.0	9.7		
Prop In Lane	1.00	1.00	1.00			0.21		
Lane Grp Cap(c), veh/h	260	232	590	1297	0	1238		
V/C Ratio(X)	0.12	0.81	0.28	0.23	0.00	0.43		
Avail Cap(c_a), veh/h	582	520	590	1297	0	1238		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	28.2	31.5	8.8	4.2	0.0	5.0		
Incr Delay (d2), s/veh	0.2	6.5	1.2	0.4	0.0	1.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	0.6	4.2	2.0	2.4	0.0	5.1		
LnGrp Delay(d),s/veh	28.4	38.0	10.0	4.6	0.0	6.1		
LnGrp LOS	C	D	A	A		A		
Approach Vol, veh/h	217			467	527			
Approach Delay, s/veh	36.7			6.5	6.1			
Approach LOS	D			A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		59.0		17.1		59.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		53.0		25.0		53.0		
Max Q Clear Time (g_c+I1), s		19.5		10.7		11.7		
Green Ext Time (p_c), s		7.3		0.6		7.5		
Intersection Summary								
HCM 2010 Ctrl Delay			11.7					
HCM 2010 LOS			B					




















HCM 2010 Signalized Intersection Summary
18: Sawmill Pkwy. & Powell Rd.

5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	111	214	82	92	197	42	154	489	72	199	954	127
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	119	230	88	99	212	45	166	526	77	214	1026	137
Adj No. of Lanes	2	2	1	1	2	0	2	2	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	1	1	1
Cap, veh/h	233	460	326	272	390	81	261	1806	887	1105	1802	883
Arrive On Green	0.07	0.13	0.13	0.07	0.13	0.12	0.10	0.68	0.67	0.09	0.67	0.66
Sat Flow, veh/h	3442	3539	1583	1792	2946	614	3442	3539	1583	3476	3574	1599
Grp Volume(v), veh/h	119	230	88	99	127	130	166	526	77	214	1026	137
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1792	1787	1773	1721	1770	1583	1738	1787	1599
Q Serve(g_s), s	3.3	6.0	4.7	4.7	6.6	6.9	4.6	6.0	1.5	2.8	15.3	2.9
Cycle Q Clear(g_c), s	3.3	6.0	4.7	4.7	6.6	6.9	4.6	6.0	1.5	2.8	15.3	2.9
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	233	460	326	272	236	234	261	1806	887	1105	1802	883
V/C Ratio(X)	✓ 0.51	0.50	0.27	0.36	0.54	0.55	0.64	0.29	0.09	0.19	0.57	0.16
Avail Cap(c_a), veh/h	241	849	500	272	429	425	275	1806	887	1209	1802	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	40.5	33.4	34.1	40.5	40.8	43.6	8.8	6.7	9.6	10.7	7.2
Incr Delay (d2), s/veh	1.7	0.8	0.4	0.8	1.9	2.0	4.4	0.4	0.2	0.1	1.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.0	2.1	2.3	3.4	3.5	2.4	2.9	0.7	1.3	7.8	1.3	
LnGrp Delay(d),s/veh	46.7	41.3	33.8	34.9	42.4	42.8	48.1	9.2	6.9	9.7	12.0	7.6
LnGrp LOS	D	D	C	C	D	D	D	A	A	A	B	A
Approach Vol, veh/h	437			356			769			1377		
Approach Delay, s/veh	41.3			40.5			17.4			11.2		
Approach LOS	D			D			B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	18.0	13.6	55.4	12.8	18.2	13.0	56.0				
Change Period (Y+Rc), s	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0				
Max Green Setting (Gmax), s	23.0	23.0	7.0	38.0	6.0	23.0	9.0	36.0				
Max Q Clear Time (g_c+I), s	8.0	8.0	6.6	17.3	5.3	8.9	4.8	8.0				
Green Ext Time (p_c), s	0.0	2.6	0.0	11.1	0.0	2.5	0.2	13.0				
Intersection Summary												
HCM 2010 Ctrl Delay	20.8											
HCM 2010 LOS	C											

HCM 2010 Signalized Intersection Summary
21: Sawmill Pkwy. & Big Bear Ave.





















5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	8	55	35	1	18	11	622	41	32	1206	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1792	1792	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	20	9	59	38	1	19	12	669	44	34	1297	17
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	6	6	6	2	2	2	2	2	2
Cap, veh/h	64	22	84	172	6	113	410	2735	180	667	2902	38
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	248	275	1065	1269	76	1437	416	3371	222	733	3577	47
Grp Volume(v), veh/h	88	0	0	38	0	20	12	351	362	34	641	673
Grp Sat Flow(s),veh/h/ln	589	0	0	1269	0	1513	416	1770	1823	733	1770	1854
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	2.8	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.23		0.67	1.00		0.95	1.00		0.12	1.00		0.03
Lane Grp Cap(c), veh/h	169	0	0	172	0	119	410	1436	1479	667	1436	1505
V/C Ratio(X)	0.52	0.00	0.00	0.22	0.00	0.17	0.03	0.24	0.24	0.05	0.45	0.45
Avail Cap(c_a), veh/h	342	0	0	313	0	287	410	1436	1479	667	1436	1505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	0.0	43.8	0.0	43.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.6	0.0	0.7	0.1	0.4	0.4	0.1	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.2	0.2	0.0	0.4	0.4
LnGrp Delay(d),s/veh	47.3	0.0	0.0	44.4	0.0	43.7	0.1	0.4	0.4	0.1	1.0	1.0
LnGrp LOS	D			D		D	A	A	A	A	A	A
Approach Vol, veh/h	88			58			725			1348		
Approach Delay, s/veh	47.3			44.1			0.4			1.0		
Approach LOS	D			D			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	86.1		13.9		86.1		13.9					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	69.0		19.0		69.0		19.0					
Max Q Clear Time (g_c+l1), s	2.0		7.3		2.0		4.8					
Green Ext Time (p_c), s	22.3		0.3		22.3		0.3					
Intersection Summary												
HCM 2010 Ctrl Delay	3.7											
HCM 2010 LOS	A											

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	1	18	57	0	25	16	595	55	24	1159	1
Conflicting Peds, #/hr	0	0	8	0	0	2	0	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	160	-	210	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	3	1	19	61	0	27	17	640	59	26	1246	1
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1662	1982	632	1359	1983	327	1255	0	0	642	0	0
Stage 1	1306	1306	-	676	676	-	-	-	-	-	-	-
Stage 2	356	676	-	683	1307	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	64	61	423	109	62	675	550	-	-	939	-	-
Stage 1	169	228	-	414	456	-	-	-	-	-	-	-
Stage 2	634	451	-	410	232	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	58	57	420	98	58	671	550	-	-	935	-	-
Mov Cap-2 Maneuver	58	57	-	98	58	-	-	-	-	-	-	-
Stage 1	163	220	-	401	441	-	-	-	-	-	-	-
Stage 2	587	436	-	378	224	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	25.9			65.4			0.3			0.2		
HCM LOS	D			F								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	550	-	-	196	98	671	935	-	-			
HCM Lane V/C Ratio ✓	0.031	-	-	0.121	0.625	0.04	0.028	-	-			
HCM Control Delay (s)	11.8	-	-	25.9	89.5	10.6	9	-	-			
HCM Lane LOS	B	-	-	D	F	B	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-	0.4	3	0.1	0.1	-	-			

HCM 2010 Signalized Intersection Summary
27: Sawmill Pkwy. & Seldom Seen Rd.

5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	29	61	84	159	28	44	29	513	81	62	938	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	31	66	90	171	30	47	31	552	87	67	1009	47
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	292	87	119	292	125	196	350	1637	257	515	1876	87
Arrive On Green	0.03	0.12	0.11	0.10	0.19	0.18	0.04	0.71	0.70	0.06	0.72	0.71
Sat Flow, veh/h	1774	715	975	1792	662	1037	1774	3066	482	1774	3444	160
Grp Volume(v), veh/h	31	0	156	171	0	77	31	318	321	67	518	538
Grp Sat Flow(s),veh/h/ln	1774	0	1691	1792	0	1698	1774	1770	1778	1774	1770	1834
Q Serve(g_s), s	1.5	0.0	8.9	8.0	0.0	3.9	0.8	6.8	7.0	1.7	13.2	13.3
Cycle Q Clear(g_c), s	1.5	0.0	8.9	8.0	0.0	3.9	0.8	6.8	7.0	1.7	13.2	13.3
Prop In Lane	1.00		0.58	1.00		0.61	1.00		0.27	1.00		0.09
Lane Grp Cap(c), veh/h	292	0	207	292	0	321	350	945	949	515	964	999
V/C Ratio(X)	0.11	0.00	0.76	0.59	0.00	0.24	0.09	0.34	0.34	0.13	0.54	0.54
Avail Cap(c_a), veh/h	322	0	287	292	0	374	433	945	949	579	964	999
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	0.0	42.7	32.4	0.0	34.7	10.2	7.7	7.9	9.4	8.1	8.1
Incr Delay (d2), s/veh	0.2	0.0	7.1	3.0	0.0	0.4	0.1	1.0	1.0	0.1	2.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	0.0	4.6	4.1	0.0	1.8	0.4	3.6	3.6	0.8	6.9	7.2
LnGrp Delay(d),s/veh	36.5	0.0	49.9	35.5	0.0	35.1	10.3	8.7	8.8	9.5	10.2	10.2
LnGrp LOS	D		D	D		D	B	A	A	A	B	B
Approach Vol, veh/h	187					248		670		1123		
Approach Delay, s/veh	47.6					35.3		8.8		10.2		
Approach LOS	D					D		A		B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.4	58.4	15.0	17.2	8.3	59.5	8.3	23.9				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	7.0	44.0	9.0	16.0	7.0	44.0	4.0	21.0				
Max Q Clear Time (g_c+l1), s	3.7	9.0	10.0	10.9	2.8	15.3	3.5	5.9				
Green Ext Time (p_c), s	0.0	13.0	0.0	0.3	0.0	12.1	0.0	0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			15.7									
HCM 2010 LOS			B									



A legacy of experience. A reputation for excellence.

2016 AM Peak Hour Full Build

Intersection												
Int Delay, s/veh	2.5											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	195	85	22	163	12	51	1	23	8	2	13
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	175	-	-	125	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	11	210	91	24	175	13	55	1	25	9	2	14












Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	190	0	0	301	0	0	516	514	255	521	554	185
Stage 1	-	-	-	-	-	-	277	277	-	231	231	-
Stage 2	-	-	-	-	-	-	239	237	-	290	323	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1390	-	-	1266	-	-	473	467	789	469	443	862
Stage 1	-	-	-	-	-	-	734	685	-	776	717	-
Stage 2	-	-	-	-	-	-	769	713	-	722	654	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1389	-	-	1266	-	-	454	454	789	443	430	860
Mov Cap-2 Maneuver	-	-	-	-	-	-	454	454	-	443	430	-
Stage 1	-	-	-	-	-	-	728	680	-	769	702	-
Stage 2	-	-	-	-	-	-	739	698	-	693	649	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.9	12.7	11
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	454	765	1389	-	-	1266	-	-	443	759
HCM Lane V/C Ratio	0.121	0.034	0.008	-	-	0.019	-	-	0.019	0.021
HCM Control Delay (s)	14	9.9	7.6	-	-	7.9	-	-	13.3	9.8
HCM Lane LOS	B	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.4	0.1	0	-	-	0.1	-	-	0.1	0.1

























HCM 2010 Signalized Intersection Summary
7: Liberty Rd & Seldom Seen Rd

5/5/2015

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	30	179	163	280	387	108		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1845	1900		
Adj Flow Rate, veh/h	32	192	175	301	416	116		
Adj No. of Lanes	1	1	1	1	1	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	2	2	3	3		
Cap, veh/h	265	237	582	1292	963	269		
Arrive On Green	0.15	0.15	0.69	0.69	0.69	0.69		
Sat Flow, veh/h	1774	1583	868	1863	1389	387		
Grp Volume(v), veh/h	32	192	175	301	0	532		
Grp Sat Flow(s),veh/h/ln	1774	1583	868	1863	0	1776		
Q Serve(g_s), s	1.2	9.0	8.4	4.5	0.0	10.0		
Cycle Q Clear(g_c), s	1.2	9.0	18.5	4.5	0.0	10.0		
Prop In Lane	1.00	1.00	1.00			0.22		
Lane Grp Cap(c), veh/h	265	237	582	1292	0	1232		
V/C Ratio(X)	✓ 0.12	0.81	0.30	0.23	0.00	0.43		
Avail Cap(c_a), veh/h	580	518	582	1292	0	1232		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	28.1	31.5	9.2	4.3	0.0	5.1		
Incr Delay (d2), s/veh	0.2	6.5	1.3	0.4	0.0	1.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	0.6	4.3	2.2	2.4	0.0	5.3		
LnGrp Delay(d),s/veh	28.3	38.0	10.5	4.7	0.0	6.2		
LnGrp LOS	C	D	B	A		A		
Approach Vol, veh/h	224			476	532			
Approach Delay, s/veh	36.6			6.8	6.2			
Approach LOS	D			A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		59.0		17.4		59.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		53.0		25.0		53.0		
Max Q Clear Time (g_c+l1), s		20.5		11.0		12.0		
Green Ext Time (p_c), s		7.4		0.6		7.6		
Intersection Summary								
HCM 2010 Ctrl Delay			12.0					
HCM 2010 LOS			B					




















HCM 2010 Signalized Intersection Summary
18: Sawmill Pkwy. & Powell Rd.

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	119	214	82	92	197	47	154	552	72	202	987	131
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	128	230	88	99	212	51	166	594	77	217	1061	141
Adj No. of Lanes	2	2	1	1	2	0	2	2	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	1	1	1
Cap, veh/h	235	460	326	272	378	89	261	1806	887	1046	1802	883
Arrive On Green	0.07	0.13	0.13	0.07	0.13	0.12	0.10	0.68	0.67	0.09	0.67	0.66
Sat Flow, veh/h	3442	3539	1583	1792	2872	676	3442	3539	1583	3476	3574	1599
Grp Volume(v), veh/h	128	230	88	99	130	133	166	594	77	217	1061	141
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1792	1787	1762	1721	1770	1583	1738	1787	1599
Q Serve(g_s), s	3.6	6.0	4.7	4.7	6.8	7.1	4.6	6.9	1.5	2.8	16.2	3.0
Cycle Q Clear(g_c), s	3.6	6.0	4.7	4.7	6.8	7.1	4.6	6.9	1.5	2.8	16.2	3.0
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	235	460	326	272	235	232	261	1806	887	1046	1802	883
V/C Ratio(X)	0.54	0.50	0.27	0.36	0.55	0.57	0.64	0.33	0.09	0.21	0.59	0.16
Avail Cap(c_a), veh/h	241	849	500	272	429	423	275	1806	887	1151	1802	883
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	40.5	33.4	34.1	40.7	41.0	43.6	9.0	6.7	9.7	10.8	7.2
Incr Delay (d2), s/veh	2.4	0.8	0.4	0.8	2.0	2.2	4.4	0.5	0.2	0.1	1.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	3.0	2.1	2.3	3.5	3.6	2.4	3.4	0.7	1.3	8.2	1.4	
LnGrp Delay(d),s/veh	47.5	41.3	33.8	34.9	42.7	43.2	48.1	9.5	6.9	9.8	12.3	7.6
LnGrp LOS	D	D	C	C	D	D	D	A	A	A	B	A
Approach Vol, veh/h	446				362		837		1419			
Approach Delay, s/veh	41.6				40.7		16.9		11.4			
Approach LOS	D				D		B		B			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	3.0	18.0	13.6	55.4	12.8	18.2	13.0	56.0				
Change Period (Y+Rc), s	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0				
Max Green Setting (Gmax), s	3.0	23.0	7.0	38.0	6.0	23.0	9.0	36.0				
Max Q Clear Time (g_c+I), s	3.0	8.0	6.6	18.2	5.6	9.1	4.8	8.9				
Green Ext Time (p_c), s	0.0	2.6	0.0	11.5	0.0	2.5	0.3	13.8				
Intersection Summary												
HCM 2010 Ctrl Delay			20.8									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
21: Sawmill Pkwy. & Big Bear Ave.

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	8	55	35	1	18	11	698	41	32	1246	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1792	1792	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	20	9	59	38	1	19	12	751	44	34	1340	17
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	6	6	6	2	2	2	2	2	2
Cap, veh/h	64	22	84	172	6	113	396	2757	161	623	2904	37
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	248	275	1065	1269	76	1437	400	3398	199	680	3579	45
Grp Volume(v), veh/h	88	0	0	38	0	20	12	391	404	34	662	695
Grp Sat Flow(s),veh/h/ln	1589	0	0	1269	0	1513	400	1770	1827	680	1770	1855
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	2.8	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.23		0.67	1.00		0.95	1.00		0.11	1.00		0.02
Lane Grp Cap(c), veh/h	169	0	0	172	0	119	396	1436	1482	623	1436	1505
V/C Ratio(X)	0.52	0.00	0.00	0.22	0.00	0.17	0.03	0.27	0.27	0.05	0.46	0.46
Avail Cap(c_a), veh/h	342	0	0	313	0	287	396	1436	1482	623	1436	1505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	0.0	43.8	0.0	43.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.6	0.0	0.7	0.1	0.5	0.5	0.2	1.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.2	0.2	0.0	0.4	0.4
LnGrp Delay(d),s/veh	47.3	0.0	0.0	44.4	0.0	43.7	0.1	0.5	0.5	0.2	1.1	1.0
LnGrp LOS	D			D		D	A	A	A	A	A	A
Approach Vol, veh/h	88			58			807			1391		
Approach Delay, s/veh	47.3			44.1			0.5			1.0		
Approach LOS	D			D			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	86.1		13.9		86.1		13.9					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	69.0		19.0		69.0		19.0					
Max Q Clear Time (g_c+I1), s	2.0		7.3		2.0		4.8					
Green Ext Time (p_c), s	25.1		0.3		25.1		0.3					
Intersection Summary												
HCM 2010 Ctrl Delay				3.6								
HCM 2010 LOS				A								

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	10	0	0	25	0	634	49	0	1220	1
Conflicting Peds, #/hr	0	0	8	0	0	2	0	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	210	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	0	0	11	0	0	27	0	682	53	0	1312	1





















Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1663	2004	664	1348	2005	348	1321	0	0	684	0	0
Stage 1	1320	1320	-	684	684	-	-	-	-	-	-	-
Stage 2	343	684	-	664	1321	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	64	59	403	111	60	654	519	-	-	905	-	-
Stage 1	166	225	-	410	452	-	-	-	-	-	-	-
Stage 2	646	447	-	421	228	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	61	59	400	108	60	650	519	-	-	901	-	-
Mov Cap-2 Maneuver	61	59	-	108	60	-	-	-	-	-	-	-
Stage 1	165	224	-	409	451	-	-	-	-	-	-	-
Stage 2	617	446	-	410	226	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.2	10.8	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	519	-	-	400	650	901	-	-
HCM Lane V/C Ratio	-	-	-	0.027	0.041	-	-	-
HCM Control Delay (s)	0	-	-	14.2	10.8	0	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

HCM 2010 Signalized Intersection Summary
27: Sawmill Pkwy. & Seldom Seen Rd.





















5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	29	64	87	177	29	52	30	522	108	77	954	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	31	69	94	190	31	56	32	561	116	83	1026	47
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	296	90	123	292	116	210	341	1539	317	496	1862	85
Arrive On Green	0.03	0.13	0.12	0.10	0.19	0.18	0.04	0.70	0.69	0.06	0.72	0.71
Sat Flow, veh/h	1774	716	975	1792	602	1087	1774	2923	603	1774	3447	158
Grp Volume(v), veh/h	31	0	163	190	0	87	32	339	338	83	527	546
Grp Sat Flow(s),veh/h/ln	1774	0	1691	1792	0	1689	1774	1770	1756	1774	1770	1835
Q Serve(g_s), s	1.5	0.0	9.3	8.9	0.0	4.4	0.8	7.7	7.9	2.1	13.9	13.9
Cycle Q Clear(g_c), s	1.5	0.0	9.3	8.9	0.0	4.4	0.8	7.7	7.9	2.1	13.9	13.9
Prop In Lane	1.00		0.58	1.00		0.64	1.00		0.34	1.00		0.09
Lane Grp Cap(c), veh/h	296	0	214	292	0	326	341	932	925	496	956	991
V/C Ratio(X)	0.10	0.00	0.76	0.65	0.00	0.27	0.09	0.36	0.37	0.17	0.55	0.55
Avail Cap(c_a), veh/h	326	0	287	292	0	372	424	932	925	554	956	991
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	0.0	42.5	32.5	0.0	34.6	10.6	8.3	8.4	9.7	8.4	8.5
Incr Delay (d2), s/veh	0.2	0.0	8.1	5.1	0.0	0.4	0.1	1.1	1.1	0.2	2.3	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	0.0	4.8	4.8	0.0	2.1	0.4	3.9	4.0	1.0	7.3	7.5
LnGrp Delay(d),s/veh	36.1	0.0	50.6	37.6	0.0	35.0	10.7	9.4	9.5	9.9	10.7	10.7
LnGrp LOS	D		D	D		D	B	A	A	A	B	B
Approach Vol, veh/h	194				277				709		1156	
Approach Delay, s/veh	48.3				36.8				9.5		10.6	
Approach LOS	D				D				A		B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	57.6	15.0	17.6	8.4	59.0	8.3	24.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	7.0	44.0	9.0	16.0	7.0	44.0	4.0	21.0				
Max Q Clear Time (g_c+I1), s	4.1	9.9	10.9	11.3	2.8	15.9	3.5	6.4				
Green Ext Time (p_c), s	0.0	13.5	0.0	0.3	0.0	12.5	0.0	0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			16.5									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

35: Sawmill Pkwy. & Drive 1

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (veh/h)	3	1	8	84	0	12	16	665	64	6	42	1182
Number	7	4	14	3	8	18	5	2	12		1	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900		1863	1863
Adj Flow Rate, veh/h	3	1	9	90	0	13	17	715	69		45	1271
Adj No. of Lanes	1	1	0	1	1	0	1	2	0		1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2
Cap, veh/h	184	14	127	187	0	139	415	2584	249		576	2875
Arrive On Green	0.09	0.09	0.09	0.09	0.00	0.09	0.79	0.79	0.79		1.00	1.00
Sat Flow, veh/h	1395	161	1447	1399	0	1583	434	3262	315		687	3629
Grp Volume(v), veh/h	3	0	10	90	0	13	17	388	396		45	620
Grp Sat Flow(s),veh/h/ln	1395	0	1607	1399	0	1583	434	1770	1807		687	1770
Q Serve(g_s), s	0.2	0.0	0.6	6.3	0.0	0.8	0.8	5.8	5.8		0.5	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.6	6.9	0.0	0.8	0.8	5.8	5.8		6.4	0.0
Prop In Lane	1.00		0.90	1.00		1.00	1.00		0.17		1.00	
Lane Grp Cap(c), veh/h	184	0	141	187	0	139	415	1402	1432		576	1402
V/C Ratio(X)	0.02	0.00	0.07	0.48	0.00	0.09	0.04	0.28	0.28		0.08	0.44
Avail Cap(c_a), veh/h	368	0	354	372	0	348	415	1402	1432		576	1402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	42.4	0.0	41.9	45.0	0.0	42.0	2.2	2.8	2.8		0.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	1.9	0.0	0.3	0.2	0.5	0.5		0.3	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	0.0	0.3	2.5	0.0	0.3	0.1	3.0	3.1		0.1	0.4
LnGrp Delay(d),s/veh	42.4	0.0	42.1	46.9	0.0	42.2	2.4	3.3	3.2		0.5	1.0
LnGrp LOS	D		D	D		D	A	A	A		A	A
Approach Vol, veh/h	13				103				801		1317	
Approach Delay, s/veh	42.2				46.4				3.2		1.0	
Approach LOS	D				D				A		A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	85.2		14.8		85.2		14.8					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	66.0		22.0		66.0		22.0					
Max Q Clear Time (g_c+I1), s	7.8		3.0		8.4		8.9					
Green Ext Time (p_c), s	22.4		0.3		22.3		0.3					
Intersection Summary												
HCM 2010 Ctrl Delay			4.1									
HCM 2010 LOS			A									
Notes												
User approved ignoring U-Turning movement.												

HCM 2010 Signalized Intersection Summary 35: Sawmill Pkwy. & Drive 1

5/5/2015

Movement	SBR
Lane Configurations	
Volume (veh/h)	1
Number	16
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	1
Adj No. of Lanes	0
Peak Hour Factor	0.93
Percent Heavy Veh, %	2
Cap, veh/h	2
Arrive On Green	1.00
Sat Flow, veh/h	3
Grp Volume(v), veh/h	652
Grp Sat Flow(s),veh/h/ln	1862
Q Serve(g_s), s	0.0
Cycle Q Clear(g_c), s	0.0
Prop In Lane	0.00
Lane Grp Cap(c), veh/h	1475
V/C Ratio(X)	0.44
Avail Cap(c_a), veh/h	1475
HCM Platoon Ratio	2.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	0.0
Incr Delay (d2), s/veh	1.0
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(-26165%),veh/ln	0.4
LnGrp Delay(d),s/veh	1.0
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	



A legacy of **experience**. A reputation for **excellence**.

2016 PM Peak Hour
No Build

HCM 2010 TWSC
4: Bunker Ln & Seldom Seen Rd.

5/1/2015

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	25	314	42	34	340	29	43	0	33	25	1	21
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	175	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	27	338	45	37	366	31	46	0	35	27	1	23













Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	399	0	0	383	0	0	882	886	360	888	893	384
Stage 1	-	-	-	-	-	-	414	414	-	456	456	-
Stage 2	-	-	-	-	-	-	468	472	-	432	437	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1165	-	-	1181	-	-	269	286	689	267	283	668
Stage 1	-	-	-	-	-	-	620	597	-	588	572	-
Stage 2	-	-	-	-	-	-	579	562	-	606	583	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1164	-	-	1181	-	-	248	270	689	242	267	666
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	270	-	242	267	-
Stage 1	-	-	-	-	-	-	606	583	-	573	553	-
Stage 2	-	-	-	-	-	-	540	543	-	561	569	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.7	17.5	16.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	248	689	1164	-	-	1181	-	-	242	624
HCM Lane V/C Ratio	0.186	0.052	0.023	-	-	0.031	-	-	0.111	0.038
HCM Control Delay (s)	22.8	10.5	8.2	-	-	8.1	-	-	21.7	11
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.7	0.2	0.1	-	-	0.1	-	-	0.4	0.1

























HCM 2010 Signalized Intersection Summary
7: Liberty Rd & Seldom Seen Rd

5/1/2015

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	117	205	187	472	302	107		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1845	1900		
Adj Flow Rate, veh/h	126	220	201	508	325	115		
Adj No. of Lanes	1	1	1	1	1	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	2	2	3	3		
Cap, veh/h	344	307	529	1014	709	251		
Arrive On Green	0.19	0.19	0.54	0.54	0.54	0.54		
Sat Flow, veh/h	1774	1583	945	1863	1302	461		
Grp Volume(v), veh/h	126	220	201	508	0	440		
Grp Sat Flow(s),veh/h/ln	1774	1583	945	1863	0	1763		
Q Serve(g_s), s	2.8	6.0	7.5	7.8	0.0	6.9		
Cycle Q Clear(g_c), s	2.8	6.0	14.5	7.8	0.0	6.9		
Prop In Lane	1.00	1.00	1.00			0.26		
Lane Grp Cap(c), veh/h	344	307	529	1014	0	960		
V/C Ratio(X)	✓ 0.37	0.72	0.38	0.50	0.00	0.46		
Avail Cap(c_a), veh/h	1083	967	1045	2031	0	1923		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	16.0	17.3	10.7	6.5	0.0	6.3		
Incr Delay (d2), s/veh	0.7	3.1	0.5	0.4	0.0	0.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	1.4	2.8	2.0	4.1	0.0	3.4		
LnGrp Delay(d),s/veh	16.7	20.4	11.2	6.9	0.0	6.7		
LnGrp LOS	B	C	B	A		A		
Approach Vol, veh/h	346			709	440			
Approach Delay, s/veh	19.1			8.1	6.7			
Approach LOS	B			A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		31.0		14.9		31.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		50.0		28.0		50.0		
Max Q Clear Time (g_c+I1), s		16.5		8.0		8.9		
Green Ext Time (p_c), s		8.5		1.0		8.8		
Intersection Summary								
HCM 2010 Ctrl Delay			10.2					
HCM 2010 LOS			B					










HCM 2010 Signalized Intersection Summary
18: Sawmill Pkwy. & Powell Rd.

5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	358	318	92	201	262	131	240	1266	126	284	771	102
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	385	342	99	216	282	141	258	1361	135	305	829	110
Adj No. of Lanes	2	2	1	1	2	0	2	2	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	1	1	1
Cap, veh/h	459	549	404	346	343	167	344	1515	849	377	1559	884
Arrive On Green	0.13	0.16	0.16	0.13	0.15	0.14	0.10	0.43	0.42	0.11	0.44	0.43
Sat Flow, veh/h	3442	3539	1583	1792	2332	1136	3442	3539	1583	3476	3574	1599
Grp Volume(v), veh/h	385	342	99	216	214	209	258	1361	135	305	829	110
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1792	1787	1681	1721	1770	1583	1738	1787	1599
Q Serve(g_s), s	13.1	10.8	6.0	12.0	13.9	14.5	8.8	42.9	5.2	10.3	20.4	4.0
Cycle Q Clear(g_c), s	13.1	10.8	6.0	12.0	13.9	14.5	8.8	42.9	5.2	10.3	20.4	4.0
Prop In Lane	1.00		1.00	1.00		0.68	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	459	549	404	346	263	247	344	1515	849	377	1559	884
V/C Ratio(X)	✓ 0.84	0.62	0.24	0.62	0.82	0.84	0.75	0.90	0.16	0.81	0.53	0.12
Avail Cap(c_a), veh/h	459	549	404	361	268	252	430	1515	849	377	1559	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.7	47.4	35.5	36.7	49.6	50.2	52.5	31.9	14.1	52.3	24.8	12.9
Incr Delay (d2), s/veh	13.0	2.2	0.3	3.1	17.2	21.9	5.5	8.8	0.4	12.5	1.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	5.5	2.6	6.2	8.2	8.2	4.4	22.8	2.4	5.6	10.3	1.8	
LnGrp Delay(d),s/veh	63.7	49.6	35.8	39.8	66.8	72.1	58.1	40.7	14.5	64.8	26.1	13.2
LnGrp LOS	E	D	D	D	E	E	E	D	B	E	C	B
Approach Vol, veh/h	826			639			1754			1244		
Approach Delay, s/veh	54.5			59.4			41.3			34.5		
Approach LOS	D			E			D			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	23.6	18.0	57.3	22.0	22.6	19.0	56.4				
Change Period (Y+Rc), s	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0				
Max Green Setting (Gmax), s	45.0	17.0	14.0	48.0	15.0	17.0	12.0	50.0				
Max Q Clear Time (g_c+I1), s	14.0	12.8	10.8	22.4	15.1	16.5	12.3	44.9				
Green Ext Time (p_c), s	0.1	1.8	0.3	18.0	0.0	0.1	0.0	4.5				
Intersection Summary												
HCM 2010 Ctrl Delay	44.4											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary
21: Sawmill Pkwy. & Big Bear Ave.

5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	20	34	53	15	19	53	1695	77	18	1040	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1792	1792	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	22	37	57	16	20	57	1823	83	19	1118	26
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	6	6	6	2	2	2	2	2	2
Cap, veh/h	87	38	47	158	64	81	461	2823	128	204	2895	67
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.82	0.82	0.81	1.00	1.00	1.00
Sat Flow, veh/h	497	427	526	1281	720	900	490	3448	156	235	3536	82
Grp Volume(v), veh/h	102	0	0	57	0	36	57	929	977	19	560	584
Grp Sat Flow(s),veh/h/ln	449	0	0	1281	0	1619	490	1770	1835	235	1770	1848
Q Serve(g_s), s	5.9	0.0	0.0	0.0	0.0	2.5	2.9	24.0	24.8	2.7	0.0	0.0
Cycle Q Clear(g_c), s	8.4	0.0	0.0	6.3	0.0	2.5	2.9	24.0	24.8	27.6	0.0	0.0
Prop In Lane	0.42		0.36	1.00		0.56	1.00		0.08	1.00		0.04
Lane Grp Cap(c), veh/h	173	0	0	158	0	145	461	1449	1502	204	1449	1513
V/C Ratio(X)	 0.59	0.00	0.00	0.36	0.00	0.25	0.12	0.64	0.65	0.09	0.39	0.39
Avail Cap(c_a), veh/h	278	0	0	246	0	256	461	1449	1502	204	1449	1513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	0.0	0.0	52.6	0.0	50.9	2.2	4.2	4.2	3.5	0.0	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.0	1.4	0.0	0.9	0.6	2.2	2.2	0.9	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.5	0.0	0.0	1.9	0.0	1.1	0.5	12.2	13.1	0.2	0.3	0.3
LnGrp Delay(d),s/veh	56.9	0.0	0.0	54.0	0.0	51.7	2.8	6.3	6.4	4.4	0.8	0.7
LnGrp LOS	E			D		D	A	A	A	A	A	A
Approach Vol, veh/h	102			93			1963			1163		
Approach Delay, s/veh	56.9			53.1			6.3			0.8		
Approach LOS	E			D			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	103.2		16.8		103.2		16.8					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	89.0		19.0		89.0		19.0					
Max Q Clear Time (g_c+I1), s	26.8		10.4		29.6		8.3					
Green Ext Time (p_c), s	46.8		0.4		45.3		0.4					
Intersection Summary												
HCM 2010 Ctrl Delay				7.2								
HCM 2010 LOS				A								

Intersection

Int Delay, s/veh 31.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	2	17	51	0	29	35	1570	125	20	1014	6
Conflicting Peds, #/hr	0	0	8	0	0	2	0	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	160	-	210	165	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	5	2	18	55	0	31	38	1688	134	22	1090	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2066	2910	556	2362	2913	851	1105	0	0	1690	0	0
Stage 1	1145	1145	-	1765	1765	-	-	-	-	-	-	-
Stage 2	921	1765	-	597	1148	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	31	15	475	~ 19	16	308	628	-	-	374	-	-
Stage 1	212	272	-	89	139	-	-	-	-	-	-	-
Stage 2	291	136	-	461	276	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	25	13	472	~ 15	14	306	628	-	-	372	-	-
Mov Cap-2 Maneuver	25	13	-	~ 15	14	-	-	-	-	-	-	-
Stage 1	198	254	-	83	130	-	-	-	-	-	-	-
Stage 2	245	128	-	413	258	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	99.4	\$ 1096.5	0.2	0.3
HCM LOS	F	F		





















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	628	-	-	62	15	306	372	-	-
HCM Lane V/C Ratio	0.06	-	-	0.416	3.656	0.102	0.058	-	-
HCM Control Delay (s)	11.1	-	-	99.4	1709.7	18.1	15.3	-	-
HCM Lane LOS	B	-	-	F	F	C	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.6	7.7	0.3	0.2	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 Signalized Intersection Summary
27: Sawmill Pkwy. & Seldom Seen Rd.

5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	97	76	245	79	95	89	1269	246	104	708	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	56	104	82	263	85	102	96	1365	265	112	761	26
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	274	126	99	315	167	200	413	1565	299	184	1873	64
Arrive On Green	0.04	0.13	0.12	0.13	0.21	0.21	0.04	0.53	0.52	0.05	0.54	0.53
Sat Flow, veh/h	1774	966	762	1792	780	936	1774	2965	567	1774	3492	119
Grp Volume(v), veh/h	56	0	186	263	0	187	96	806	824	112	386	401
Grp Sat Flow(s),veh/h/ln	1774	0	1728	1792	0	1716	1774	1770	1763	1774	1770	1842
Q Serve(g_s), s	3.2	0.0	12.6	15.0	0.0	11.6	3.0	47.4	49.7	3.4	15.5	15.5
Cycle Q Clear(g_c), s	3.2	0.0	12.6	15.0	0.0	11.6	3.0	47.4	49.7	3.4	15.5	15.5
Prop In Lane	1.00		0.44	1.00		0.55	1.00		0.32	1.00		0.06
Lane Grp Cap(c), veh/h	274	0	225	315	0	367	413	934	931	184	949	988
V/C Ratio(X)	0.20	0.00	0.83	0.84	0.00	0.51	0.23	0.86	0.89	0.61	0.41	0.41
Avail Cap(c_a), veh/h	274	0	230	315	0	372	413	934	931	184	949	988
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	0.0	51.1	38.4	0.0	41.9	12.8	24.6	25.3	26.0	16.5	16.5
Incr Delay (d2), s/veh	0.4	0.0	20.8	17.5	0.0	1.1	0.3	10.4	12.1	5.8	1.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.6	0.0	7.3	8.9	0.0	5.6	1.4	25.8	27.2	2.3	7.8	8.2
LnGrp Delay(d),s/veh	42.8	0.0	71.9	55.9	0.0	43.0	13.1	35.0	37.3	31.8	17.8	17.8
LnGrp LOS	D		E	E		D	B	C	D	C	B	B
Approach Vol, veh/h	242				450				1726		899	
Approach Delay, s/veh	65.1				50.5				34.9		19.5	
Approach LOS	E				D				C		B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	68.3	20.0	20.7	10.0	69.3	10.0	30.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	62.0	14.0	15.0	4.0	63.0	4.0	25.0				
Max Q Clear Time (g_c+I1), s	5.4	51.7	17.0	14.6	5.0	17.5	5.2	13.6				
Green Ext Time (p_c), s	0.0	8.6	0.0	0.1	0.0	26.2	0.0	0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			35.1									
HCM 2010 LOS			D									















A legacy of **experience**. A reputation for **excellence**.

2016 PM Peak Hour Full Build

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	25	320	70	40	343	29	83	0	44	25	1	21
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	175	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	27	344	75	43	369	31	89	0	47	27	1	23
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	402	0	0	419	0	0	919	923	382	931	945	387
Stage 1	-	-	-	-	-	-	435	435	-	472	472	-
Stage 2	-	-	-	-	-	-	484	488	-	459	473	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2:209	-	-	2:209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1162	-	-	1145	-	-	254	272	670	249	264	665
Stage 1	-	-	-	-	-	-	604	584	-	576	562	-
Stage 2	-	-	-	-	-	-	568	553	-	586	562	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1161	-	-	1145	-	-	233	255	670	220	248	663
Mov Cap-2 Maneuver	-	-	-	-	-	-	233	255	-	220	248	-
Stage 1	-	-	-	-	-	-	590	570	-	562	540	-
Stage 2	-	-	-	-	-	-	527	531	-	532	549	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.8			23.2			17.7		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
Capacity (veh/h)	233	670	1161	-	-	1145	-	-	220	616		
HCM Lane V/C Ratio	0.383	0.071	0.023	-	-	0.038	-	-	0.122	0.038		
HCM Control Delay (s)	29.7	10.8	8.2	-	-	8.3	-	-	23.6	11.1		
HCM Lane LOS	D	B	A	-	-	A	-	-	C	B		
HCM 95th %tile Q(veh)	1.7	0.2	0.1	-	-	0.1	-	-	0.4	0.1		

























HCM 2010 Signalized Intersection Summary
7: Liberty Rd & Seldom Seen Rd

5/5/2015

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	123	216	193	472	302	110		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1845	1900		
Adj Flow Rate, veh/h	132	232	208	508	325	118		
Adj No. of Lanes	1	1	1	1	1	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	2	2	3	3		
Cap, veh/h	356	318	523	1018	706	256		
Arrive On Green	0.20	0.20	0.55	0.55	0.55	0.55		
Sat Flow, veh/h	1774	1583	943	1863	1293	469		
Grp Volume(v), veh/h	132	232	208	508	0	443		
Grp Sat Flow(s),veh/h/ln	1774	1583	943	1863	0	1762		
Q Serve(g_s), s	3.0	6.5	8.1	8.1	0.0	7.2		
Cycle Q Clear(g_c), s	3.0	6.5	15.4	8.1	0.0	7.2		
Prop In Lane	1.00	1.00	1.00			0.27		
Lane Grp Cap(c), veh/h	356	318	523	1018	0	963		
V/C Ratio(X)	0.37	0.73	0.40	0.50	0.00	0.46		
Avail Cap(c_a), veh/h	1047	935	1002	1963	0	1857		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	16.4	17.8	11.2	6.7	0.0	6.5		
Incr Delay (d2), s/veh	0.6	3.2	0.5	0.4	0.0	0.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	1.5	3.1	2.2	4.2	0.0	3.5		
LnGrp Delay(d),s/veh	17.0	21.0	11.7	7.1	0.0	6.9		
LnGrp LOS	B	C	B	A		A		
Approach Vol, veh/h	364			716	443			
Approach Delay, s/veh	19.6			8.4	6.9			
Approach LOS	B			A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		31.9		15.5		31.9		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		50.0		28.0		50.0		
Max Q Clear Time (g_c+I1), s		17.4		8.5		9.2		
Green Ext Time (p_c), s		8.6		1.1		8.9		
Intersection Summary								
HCM 2010 Ctrl Delay			10.6					
HCM 2010 LOS			B					




















HCM 2010 Signalized Intersection Summary
18: Sawmill Pkwy. & Powell Rd.

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	363	318	92	201	262	134	240	1309	126	290	847	111
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	390	342	99	216	282	144	258	1408	135	312	911	119
Adj No. of Lanes	2	2	1	1	2	0	2	2	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	1	1	1
Cap, veh/h	430	555	407	333	344	171	344	1568	860	348	1583	882
Arrive On Green	0.13	0.16	0.16	0.12	0.15	0.14	0.10	0.44	0.43	0.10	0.44	0.43
Sat Flow, veh/h	3442	3539	1583	1792	2315	1151	3442	3539	1583	3476	3574	1599
Grp Volume(v), veh/h	390	342	99	216	216	210	258	1408	135	312	911	119
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1792	1787	1678	1721	1770	1583	1738	1787	1599
Q Serve(g_s), s	13.4	10.8	5.9	12.1	14.0	14.6	8.8	44.1	5.1	10.7	22.9	4.3
Cycle Q Clear(g_c), s	13.4	10.8	5.9	12.1	14.0	14.6	8.8	44.1	5.1	10.7	22.9	4.3
Prop In Lane	1.00		1.00	1.00		0.69	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	430	555	407	333	265	249	344	1568	860	348	1583	882
V/C Ratio(X)	0.91	0.62	0.24	0.65	0.81	0.84	0.75	0.90	0.16	0.90	0.58	0.13
Avail Cap(c_a), veh/h	430	560	409	333	268	252	430	1568	860	348	1583	882
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.8	47.2	35.3	37.4	49.5	50.1	52.5	30.9	13.7	53.4	25.0	13.0
Incr Delay (d2), s/veh	22.5	2.0	0.3	4.4	17.1	21.8	5.5	8.5	0.4	24.8	1.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	5.4	2.6	6.3	8.2	8.3	4.4	23.4	2.3	6.3	11.6	2.0	
LnGrp Delay(d),s/veh	74.4	49.2	35.6	41.7	66.6	71.9	58.1	39.4	14.1	78.2	26.5	13.4
LnGrp LOS	E	D	D	D	E	E	E	D	B	E	C	B
Approach Vol, veh/h	831		642				1801			1342		
Approach Delay, s/veh	59.4		60.0				40.2			37.4		
Approach LOS	E		E				D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc),s	20.0	23.8	18.0	58.2	21.0	22.8	18.0	58.2				
Change Period (Y+Rc), s	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0				
Max Green Setting (Gmax),s	13.0	18.0	14.0	49.0	14.0	17.0	11.0	52.0				
Max Q Clear Time (g_c+I),s	14.1	12.8	10.8	24.9	15.4	16.6	12.7	46.1				
Green Ext Time (p_c), s	0.0	2.2	0.3	18.1	0.0	0.2	0.0	5.3				
Intersection Summary												
HCM 2010 Ctrl Delay			45.6									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary
21: Sawmill Pkwy. & Big Bear Ave.

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	20	34	53	15	19	53	1747	77	18	1131	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1792	1792	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	22	37	57	16	20	57	1878	83	19	1216	26
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	6	6	6	2	2	2	2	2	2
Cap, veh/h	87	38	47	158	64	81	425	2828	124	193	2901	62
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.82	0.82	0.81	1.00	1.00	1.00
Sat Flow, veh/h	497	427	526	1281	720	900	446	3454	151	223	3543	76
Grp Volume(v), veh/h	102	0	0	57	0	36	57	955	1006	19	607	635
Grp Sat Flow(s),veh/h/ln	449	0	0	1281	0	1619	446	1770	1836	223	1770	1849
Q Serve(g_s), s	5.9	0.0	0.0	0.0	0.0	2.5	3.2	25.5	26.4	3.1	0.0	0.0
Cycle Q Clear(g_c), s	8.4	0.0	0.0	6.3	0.0	2.5	3.2	25.5	26.4	29.5	0.0	0.0
Prop In Lane	0.42		0.36	1.00		0.56	1.00		0.08	1.00		0.04
Lane Grp Cap(c), veh/h	173	0	0	158	0	145	425	1449	1503	193	1449	1514
V/C Ratio(X)	0.59	0.00	0.00	0.36	0.00	0.25	0.13	0.66	0.67	0.10	0.42	0.42
Avail Cap(c_a), veh/h	278	0	0	246	0	256	425	1449	1503	193	1449	1514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	0.0	0.0	52.6	0.0	50.9	2.3	4.3	4.4	4.0	0.0	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.0	1.4	0.0	0.9	0.7	2.4	2.4	1.0	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	0.0	1.9	0.0	1.1	0.5	13.2	14.1	0.2	0.4	0.4
LnGrp Delay(d),s/veh	56.9	0.0	0.0	54.0	0.0	51.7	2.9	6.7	6.8	5.0	0.9	0.9
LnGrp LOS	E			D		D	A	A	A	A	A	A
Approach Vol, veh/h	102			93			2018			1261		
Approach Delay, s/veh	56.9			53.1			6.6			0.9		
Approach LOS	E			D			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	103.2		16.8		103.2		16.8					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	89.0		19.0		89.0		19.0					
Max Q Clear Time (g_c+I1), s	28.4		10.4		31.5		8.3					
Green Ext Time (p_c), s	48.6		0.4		46.6		0.4					
Intersection Summary												
HCM 2010 Ctrl Delay				7.3								
HCM 2010 LOS				A								

Intersection												
Int Delay, s/veh	0.3											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	10	0	0	37	0	1611	114	0	1068	6
Conflicting Peds, #/hr	0	0	8	0	0	2	0	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	210	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	0	0	11	0	0	40	0	1732	123	0	1148	6




















Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2028	2894	585	2316	2897	873	1163	0	0	1734	0	0
Stage 1	1160	1160	-	1734	1734	-	-	-	-	-	-	-
Stage 2	868	1734	-	582	1163	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	34	16	454	21	16	297	596	-	-	359	-	-
Stage 1	208	268	-	93	144	-	-	-	-	-	-	-
Stage 2	314	141	-	471	271	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	29	16	451	20	16	295	596	-	-	358	-	-
Mov Cap-2 Maneuver	29	16	-	20	16	-	-	-	-	-	-	-
Stage 1	207	266	-	93	144	-	-	-	-	-	-	-
Stage 2	271	141	-	460	269	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	19.1	0	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	596	-	-	451	295	358	-	-
HCM Lane V/C Ratio	-	-	-	0.024	0.135	-	-	-
HCM Control Delay (s)	0	-	-	13.2	19.1	0	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0	-	-

HCM 2010 Signalized Intersection Summary
27: Sawmill Pkwy. & Seldom Seen Rd.




















5/6/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	99	78	266	82	113	92	1289	268	114	719	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	56	106	84	286	88	122	99	1386	288	123	773	26
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	269	128	101	329	158	219	399	1516	309	301	1838	62
Arrive On Green	0.05	0.13	0.12	0.13	0.22	0.21	0.08	1.00	1.00	0.05	0.53	0.52
Sat Flow, veh/h	1774	964	764	1792	715	991	1774	2929	598	1774	3494	118
Grp Volume(v), veh/h	56	0	190	286	0	210	99	827	847	123	391	408
Grp Sat Flow(s),veh/h/ln	1774	0	1728	1792	0	1706	1774	1770	1757	1774	1770	1842
Q Serve(g_s), s	3.2	0.0	12.9	16.0	0.0	13.2	3.2	0.0	0.0	3.9	16.2	16.2
Cycle Q Clear(g_c), s	3.2	0.0	12.9	16.0	0.0	13.2	3.2	0.0	0.0	3.9	16.2	16.2
Prop In Lane	1.00		0.44	1.00		0.58	1.00		0.34	1.00		0.06
Lane Grp Cap(c), veh/h	269	0	229	329	0	376	399	916	910	301	931	969
V/C Ratio(X)	0.21	0.00	0.83	0.87	0.00	0.56	0.25	0.90	0.93	0.41	0.42	0.42
Avail Cap(c_a), veh/h	293	0	230	329	0	376	399	916	910	301	931	969
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	0.0	51.0	38.2	0.0	41.8	12.9	0.0	0.0	12.1	17.3	17.3
Incr Delay (d2), s/veh	0.4	0.0	21.8	21.3	0.0	1.8	0.3	13.9	17.1	0.9	1.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.6	0.0	7.5	3.4	0.0	6.4	1.6	3.5	4.3	1.9	8.2	8.5
LnGrp Delay(d),s/veh	42.3	0.0	72.8	59.5	0.0	43.7	13.2	13.9	17.1	12.9	18.7	18.7
LnGrp LOS	D		E	E		D	B	B	B	B	B	B
Approach Vol, veh/h	246				496		1773				922	
Approach Delay, s/veh	65.8				52.8		15.4				17.9	
Approach LOS	E				D		B				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	67.1	21.0	20.9	10.0	68.1	10.4	31.5				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	61.0	15.0	15.0	4.0	62.0	6.0	24.0				
Max Q Clear Time (g_c+I1), s	5.9	2.0	18.0	14.9	5.2	18.2	5.2	15.2				
Green Ext Time (p_c), s	0.0	31.3	0.0	0.0	0.0	26.7	0.0	0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			25.1									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

35: Sawmill Pkwy. & Drive 1

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (veh/h)	5	2	8	124	1	20	35	1717	49	3	33	1042
Number	7	4	14	3	8	18	5	2	12		1	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900		1863	1863
Adj Flow Rate, veh/h	5	2	9	133	1	22	38	1846	53		35	1120
Adj No. of Lanes	1	1	0	1	1	0	1	2	0		1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2
Cap, veh/h	203	35	155	215	8	178	452	2753	79		188	2842
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.78	0.78	0.78		1.00	1.00
Sat Flow, veh/h	1383	296	1332	1398	69	1524	500	3514	100		237	3629
Grp Volume(v), veh/h	5	0	11	133	0	23	38	926	973		35	546
Grp Sat Flow(s),veh/h/ln	1383	0	1628	1398	0	1594	500	1770	1845		237	1770
Q Serve(g_s), s	0.4	0.0	0.7	11.2	0.0	1.6	2.1	28.5	29.0		6.8	0.0
Cycle Q Clear(g_c), s	1.9	0.0	0.7	11.9	0.0	1.6	2.1	28.5	29.0		35.8	0.0
Prop In Lane	1.00		0.82	1.00		0.96	1.00		0.05		1.00	
Lane Grp Cap(c), veh/h	203	0	190	215	0	186	452	1386	1445		188	1386
V/C Ratio(X)	0.02	0.00	0.06	0.62	0.00	0.12	0.08	0.67	0.67		0.19	0.39
Avail Cap(c_a), veh/h	226	0	217	238	0	212	452	1386	1445		188	1386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	48.4	0.0	47.1	52.4	0.0	47.5	3.0	5.9	6.0		5.5	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	4.1	0.0	0.3	0.4	2.6	2.5		2.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.2	0.0	0.3	4.6	0.0	0.7	0.3	14.6	15.6		0.5	0.3
LnGrp Delay(d),s/veh	48.4	0.0	47.3	56.6	0.0	47.8	3.4	8.5	8.5		7.7	0.8
LnGrp LOS	D		D	E		D	A	A	A		A	A
Approach Vol, veh/h	16				156		1937				1156	
Approach Delay, s/veh	47.6				55.3		8.4				1.0	
Approach LOS	D				E		A				A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	100.0		20.0		100.0		20.0					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	92.0		16.0		92.0		16.0					
Max Q Clear Time (g_c+I1), s	31.0		3.9		37.8		13.9					
Green Ext Time (p_c), s	45.9		0.4		42.0		0.1					
Intersection Summary												
HCM 2010 Ctrl Delay			8.2									
HCM 2010 LOS			A									
Notes												

HCM 2010 Signalized Intersection Summary

35: Sawmill Pkwy. & Drive 1

5/5/2015

Movement	SBR
Lane Configurations	
Volume (veh/h)	1
Number	16
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	1
Adj No. of Lanes	0
Peak Hour Factor	0.93
Percent Heavy Veh, %	2
Cap, veh/h	3
Arrive On Green	1.00
Sat Flow, veh/h	3
Grp Volume(v), veh/h	575
Grp Sat Flow(s),veh/h/ln	1862
Q Serve(g_s), s	0.0
Cycle Q Clear(g_c), s	0.0
Prop In Lane	0.00
Lane Grp Cap(c), veh/h	1459
V/C Ratio(X)	0.39
Avail Cap(c_a), veh/h	1459
HCM Platoon Ratio	2.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	0.0
Incr Delay (d2), s/veh	0.8
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(-26165%),veh/ln	0.3
LnGrp Delay(d),s/veh	0.8
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

User approved ignoring U-Turning movement.



A legacy of **experience**. A reputation for **excellence**.

APPENDIX F:

Capacity Analysis Reports
Year 2036



A legacy of experience. A reputation for excellence.

2036 AM Peak Hour
No Build

Intersection												
Int Delay, s/veh	1.6											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	314	46	14	259	11	29	1	18	8	2	13
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	175	-	-	125	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	11	338	49	15	278	12	31	1	19	9	2	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	387	0	0	709	706	362	711	726	287
Stage 1	-	-	-	-	-	-	384	384	-	317	317	-
Stage 2	-	-	-	-	-	-	325	322	-	394	409	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1275	-	-	1177	-	-	352	363	687	351	354	757
Stage 1	-	-	-	-	-	-	643	615	-	698	658	-
Stage 2	-	-	-	-	-	-	692	655	-	635	600	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1274	-	-	1177	-	-	338	355	687	334	346	755
Mov Cap-2 Maneuver	-	-	-	-	-	-	338	355	-	334	346	-
Stage 1	-	-	-	-	-	-	637	610	-	691	649	-
Stage 2	-	-	-	-	-	-	668	646	-	611	595	-













Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	14.3	12.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	338	655	1274	-	-	1177	-	-	334	652
HCM Lane V/C Ratio	0.092	0.031	0.008	-	-	0.013	-	-	0.026	0.025
HCM Control Delay (s)	16.7	10.7	7.9	-	-	8.1	-	-	16.1	10.7
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	0.1	0	-	-	0	-	-	0.1	0.1

HCM 2010 Signalized Intersection Summary

























7: Liberty Rd & Seldom Seen Rd

5/1/2015

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	46	283	274	506	699	185		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1845	1900		
Adj Flow Rate, veh/h	49	304	295	544	752	199		
Adj No. of Lanes	1	1	1	1	1	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	2	2	3	3		
Cap, veh/h	315	281	275	1283	969	256		
Arrive On Green	0.18	0.18	0.69	0.69	0.69	0.69		
Sat Flow, veh/h	1774	1583	588	1863	1407	372		
Grp Volume(v), veh/h	49	304	295	544	0	951		
Grp Sat Flow(s),veh/h/ln	1774	1583	588	1863	0	1779		
Q Serve(g_s), s	2.1	16.0	29.8	11.6	0.0	32.2		
Cycle Q Clear(g_c), s	2.1	16.0	62.0	11.6	0.0	32.2		
Prop In Lane	1.00	1.00	1.00			0.21		
Lane Grp Cap(c), veh/h	315	281	275	1283	0	1226		
V/C Ratio(X) Δ	0.16	1.08	1.07	0.42	0.00	0.78		
Avail Cap(c_a), veh/h	315	281	275	1283	0	1226		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	31.3	37.0	34.4	6.2	0.0	9.4		
Incr Delay (d2), s/veh	0.2	76.6	75.2	1.0	0.0	4.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	1.1	12.9	12.5	6.3	0.0	17.2		
LnGrp Delay(d),s/veh	31.5	113.6	109.6	7.2	0.0	14.2		
LnGrp LOS	C	F	F	A		B		
Approach Vol, veh/h	353			839	951			
Approach Delay, s/veh	102.2			43.2	14.2			
Approach LOS	F			D	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		68.0		22.0		68.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		62.0		16.0		62.0		
Max Q Clear Time (g_c+I1), s		64.0		18.0		34.2		
Green Ext Time (p_c), s		0.0		0.0		17.3		
Intersection Summary								
HCM 2010 Ctrl Delay			40.1					
HCM 2010 LOS			D					




















HCM 2010 Signalized Intersection Summary
18: Sawmill Pkwy. & Powell Rd.

5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	164	318	122	137	293	62	278	868	130	358	1701	228
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	176	342	131	147	315	67	299	933	140	385	1829	245
Adj No. of Lanes	2	2	1	1	2	0	2	2	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	1	1	1
Cap, veh/h	241	587	389	268	488	102	275	1610	799	757	1659	822
Arrive On Green	0.07	0.17	0.17	0.07	0.17	0.16	0.11	0.61	0.59	0.12	0.62	0.60
Sat Flow, veh/h	3442	3539	1583	1792	2942	618	3442	3539	1583	3476	3574	1599
Grp Volume(v), veh/h	176	342	131	147	190	192	299	933	140	385	1829	245
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1792	1787	1772	1721	1770	1583	1738	1787	1599
Q Serve(g_s), s	5.0	8.9	6.8	6.8	9.9	10.2	8.0	16.0	3.6	5.7	46.4	6.8
Cycle Q Clear(g_c), s	5.0	8.9	6.8	6.8	9.9	10.2	8.0	16.0	3.6	5.7	46.4	6.8
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	587	389	268	296	294	275	1610	799	757	1659	822
V/C Ratio(X)	0.73	0.58	0.34	0.55	0.64	0.65	1.09	0.58	0.18	0.51	1.10	0.30
Avail Cap(c_a), veh/h	241	849	507	268	429	425	275	1610	799	794	1659	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	38.5	31.0	32.3	38.9	39.2	44.7	13.9	9.7	13.3	19.1	9.8
Incr Delay (d2), s/veh	10.7	0.9	0.5	2.3	2.3	2.5	79.1	1.5	0.5	0.5	55.7	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	4.4	3.0	3.5	5.1	5.2	6.8	8.1	1.7	2.7	35.3	3.2	
LnGrp Delay(d),s/veh	56.3	39.4	31.5	34.6	41.2	41.7	123.8	15.5	10.2	13.8	74.9	10.7
LnGrp LOS	E	D	C	C	D	D	F	B	B	B	F	B
Approach Vol, veh/h		649			529			1372			2459	
Approach Delay, s/veh		42.4			39.6			38.5			58.9	
Approach LOS		D			D			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	21.6	14.0	51.4	13.0	21.6	14.9	50.5				
Change Period (Y+Rc), s	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0				
Max Green Setting (Gmax), s	23.0	23.0	7.0	38.0	6.0	23.0	9.0	36.0				
Max Q Clear Time (g_c+I), s	10.9	10.9	10.0	48.4	7.0	12.2	7.7	18.0				
Green Ext Time (p_c), s	0.0	3.6	0.0	0.0	0.0	3.4	0.2	16.1				
Intersection Summary												
HCM 2010 Ctrl Delay			49.1									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary
21: Sawmill Pkwy. & Big Bear Ave.

5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	8	55	35	1	18	20	1107	73	57	2152	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1792	1792	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	20	9	59	38	1	19	22	1190	78	61	2314	30
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	6	6	6	2	2	2	2	2	2
Cap, veh/h	64	22	84	172	6	113	196	2736	179	425	2903	38
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	248	275	1065	1269	76	1437	153	3372	221	435	3578	46
Grp Volume(v), veh/h	88	0	0	38	0	20	22	624	644	61	1142	1202
Grp Sat Flow(s),veh/h/ln	1589	0	0	1269	0	1513	153	1770	1823	435	1770	1855
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	2.8	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.23		0.67	1.00		0.95	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	169	0	0	172	0	119	196	1436	1479	425	1436	1505
V/C Ratio(X)	△ 0.52	0.00	0.00	0.22	0.00	0.17	0.11	0.43	0.44	0.14	0.80	0.80
Avail Cap(c_a), veh/h	342	0	0	313	0	287	196	1436	1479	425	1436	1505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	0.0	43.8	0.0	43.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.6	0.0	0.7	1.2	1.0	0.9	0.7	4.6	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	0.0	1.0	0.0	0.5	0.1	0.4	0.4	0.1	1.8	1.9
LnGrp Delay(d),s/veh	47.3	0.0	0.0	44.4	0.0	43.7	1.2	1.0	0.9	0.7	4.6	4.5
LnGrp LOS	D			D		D	A	A	A	A	A	A
Approach Vol, veh/h	88			58			1290			2405		
Approach Delay, s/veh	47.3			44.1			1.0			4.5		
Approach LOS	D			D			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	86.1		13.9		86.1		13.9					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	69.0		19.0		69.0		19.0					
Max Q Clear Time (g_c+I1), s	2.0		7.3		2.0		4.8					
Green Ext Time (p_c), s	60.4		0.3		60.4		0.3					
Intersection Summary												
HCM 2010 Ctrl Delay				4.9								
HCM 2010 LOS				A								

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	10	0	0	19	0	1097	40	0	2126	1
Conflicting Peds, #/hr	0	0	8	0	0	2	0	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	210	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	0	0	11	0	0	20	0	1180	43	0	2286	1






















Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2887	3477	1152	2333	3477	597	2295	0	0	1182	0	0
Stage 1	2295	2295	-	1182	1182	-	-	-	-	-	-	-
Stage 2	592	1182	-	1151	2295	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	7	6	191	20	7	451	216	-	-	587	-	-
Stage 1	40	73	-	205	266	-	-	-	-	-	-	-
Stage 2	460	262	-	214	75	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	7	6	190	19	7	448	216	-	-	585	-	-
Mov Cap-2 Maneuver	7	6	-	19	7	-	-	-	-	-	-	-
Stage 1	40	73	-	205	266	-	-	-	-	-	-	-
Stage 2	437	262	-	202	75	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.1	13.4	0	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	216	-	-	190	448	585	-	-
HCM Lane V/C Ratio	-	-	-	0.057	0.046	-	-	-
HCM Control Delay (s)	0	-	-	25.1	13.4	0	-	-
HCM Lane LOS	A	-	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

HCM 2010 Signalized Intersection Summary
27: Sawmill Pkwy. & Seldom Seen Rd.




















5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	99	138	260	45	72	51	920	145	112	1688	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	51	106	148	280	48	77	55	989	156	120	1815	85
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	302	99	138	233	122	195	145	1562	246	338	1821	85
Arrive On Green	0.04	0.14	0.13	0.09	0.19	0.18	0.05	0.68	0.66	0.08	0.70	0.69
Sat Flow, veh/h	1774	705	984	1792	652	1045	1774	3064	483	1774	3444	160
Grp Volume(v), veh/h	51	0	254	280	0	125	55	571	574	120	926	974
Grp Sat Flow(s),veh/h/ln	1774	0	1689	1792	0	1697	1774	1770	1778	1774	1770	1834
Q Serve(g_s), s	2.4	0.0	14.0	9.0	0.0	6.5	1.4	18.2	18.4	3.1	51.1	52.9
Cycle Q Clear(g_c), s	2.4	0.0	14.0	9.0	0.0	6.5	1.4	18.2	18.4	3.1	51.1	52.9
Prop In Lane	1.00		0.58	1.00		0.62	1.00		0.27	1.00		0.09
Lane Grp Cap(c), veh/h	302	0	236	233	0	317	145	902	906	338	936	970
V/C Ratio(X)	0.17	0.00	1.07	1.20	0.00	0.39	0.38	0.63	0.63	0.35	0.99	1.00
Avail Cap(c_a), veh/h	314	0	236	233	0	317	214	902	906	391	936	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	0.0	43.3	36.1	0.0	36.0	23.1	10.8	11.0	11.9	14.6	14.9
Incr Delay (d2), s/veh	0.3	0.0	79.6	123.9	0.0	0.8	1.6	3.4	3.4	0.6	27.1	29.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.2	0.0	11.7	10.0	0.0	3.1	0.8	9.5	9.6	1.6	31.4	33.9
LnGrp Delay(d),s/veh	34.6	0.0	122.9	159.9	0.0	36.8	24.7	14.2	14.3	12.5	41.7	44.8
LnGrp LOS	C		F	F		D	C	B	B	B	D	F
Approach Vol, veh/h		305			405			1200			2020	
Approach Delay, s/veh		108.1			121.9			14.7			41.5	
Approach LOS		F			F			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	56.0	14.0	19.0	9.1	57.9	9.3	23.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	8.0	47.0	8.0	13.0	7.0	48.0	4.0	17.0				
Max Q Clear Time (g_c+l1), s	5.1	20.4	11.0	16.0	3.4	54.9	4.4	8.5				
Green Ext Time (p_c), s	0.1	22.7	0.0	0.0	0.0	0.0	0.0	0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			46.8									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary

35: Sawmill Pkwy. & Drive 1

5/1/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (veh/h)	3	1	8	59	0	8	16	1140	36	6	26	2104
Number	7	4	14	3	8	18	5	2	12		1	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900		1863	1863
Adj Flow Rate, veh/h	3	1	9	63	0	9	17	1226	39		28	2262
Adj No. of Lanes	1	1	0	1	1	0	1	2	0		1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2
Cap, veh/h	155	10	94	154	0	103	207	2854	91		425	2960
Arrive On Green	0.06	0.06	0.06	0.06	0.00	0.06	1.00	1.00	0.82		1.00	1.00
Sat Flow, veh/h	1400	161	1447	1399	0	1583	165	3501	111		436	3630
Grp Volume(v), veh/h	3	0	10	63	0	9	17	619	646		28	1102
Grp Sat Flow(s),veh/h/ln	1400	0	1607	1399	0	1583	165	1770	1843		436	1770
Q Serve(g_s), s	0.2	0.0	0.6	4.4	0.0	0.5	0.0	0.0	0.7		0.1	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.6	5.0	0.0	0.5	0.0	0.0	0.7		0.7	0.0
Prop In Lane	1.00		0.90	1.00		1.00	1.00		0.06		1.00	
Lane Grp Cap(c), veh/h	155	0	104	154	0	103	207	1443	1503		425	1443
V/C Ratio(X)	0.02	0.00	0.10	0.41	0.00	0.09	0.08	0.43	0.43		0.07	0.76
Avail Cap(c_a), veh/h	289	0	257	288	0	253	207	1443	1503		425	1443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.00		1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	44.3	0.0	44.0	46.4	0.0	44.0	0.0	0.0	0.1		0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.4	1.7	0.0	0.4	0.8	0.9	0.9		0.3	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	0.0	0.3	1.8	0.0	0.2	0.0	0.4	0.6		0.0	1.6
LnGrp Delay(d),s/veh	44.4	0.0	44.4	48.1	0.0	44.3	0.8	0.9	1.0		0.3	3.9
LnGrp LOS	D		D	D		D	A	A	A		A	A
Approach Vol, veh/h	13				72		1282				2291	
Approach Delay, s/veh	44.4				47.6		1.0				3.8	
Approach LOS	D				D		A				A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	87.5		12.5		87.5		12.5					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	72.0		16.0		72.0		16.0					
Max Q Clear Time (g_c+I1), s	2.7		2.7		2.7		7.0					
Green Ext Time (p_c), s	60.0		0.2		60.0		0.1					
Intersection Summary												
HCM 2010 Ctrl Delay			3.8									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary 35: Sawmill Pkwy. & Drive 1

5/1/2015

Movement	SBR
Lane Configurations	
Volume (veh/h)	1
Number	16
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	1
Adj No. of Lanes	0
Peak Hour Factor	0.93
Percent Heavy Veh, %	2
Cap, veh/h	1
Arrive On Green	1.00
Sat Flow, veh/h	2
Grp Volume(v), veh/h	1161
Grp Sat Flow(s),veh/h/ln	1862
Q Serve(g_s), s	0.0
Cycle Q Clear(g_c), s	0.0
Prop In Lane	0.00
Lane Grp Cap(c), veh/h	1518
V/C Ratio(X)	0.76
Avail Cap(c_a), veh/h	1518
HCM Platoon Ratio	2.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	0.0
Incr Delay (d2), s/veh	3.7
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(-26165%),veh/ln	1.6
LnGrp Delay(d),s/veh	3.7
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	



A legacy of experience. A reputation for excellence.

2036 AM Peak Hour Full Build

HCM 2010 TWSC
4: Bunker Ln & Seldom Seen Rd.

5/5/2015

Intersection

Int Delay, s/veh 2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	317	86	23	264	11	51	1	23	8	2	13
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	175	-	-	125	-	-	125	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	11	341	92	25	284	12	55	1	25	9	2	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	298	0	0	433	0	0	758	756	387	763	796	293
Stage 1	-	-	-	-	-	-	409	409	-	341	341	-
Stage 2	-	-	-	-	-	-	349	347	-	422	455	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1269	-	-	1132	-	-	326	340	665	324	322	751
Stage 1	-	-	-	-	-	-	623	600	-	678	642	-
Stage 2	-	-	-	-	-	-	671	638	-	613	572	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1268	-	-	1132	-	-	311	329	665	303	312	749
Mov Cap-2 Maneuver	-	-	-	-	-	-	311	329	-	303	312	-
Stage 1	-	-	-	-	-	-	618	595	-	671	627	-
Stage 2	-	-	-	-	-	-	641	623	-	584	567	-












Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.6	16.4	13.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	311	638	1268	-	-	1132	-	-	303	631
HCM Lane V/C Ratio	0.176	0.04	0.008	-	-	0.022	-	-	0.028	0.026
HCM Control Delay (s)	19	10.9	7.9	-	-	8.3	-	-	17.2	10.9
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.6	0.1	0	-	-	0.1	-	-	0.1	0.1

HCM 2010 Signalized Intersection Summary

7: Liberty Rd & Seldom Seen Rd


























5/5/2015

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	48	288	283	506	699	190		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1845	1900		
Adj Flow Rate, veh/h	52	310	304	544	752	204		
Adj No. of Lanes	1	1	1	1	1	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	2	2	3	3		
Cap, veh/h	315	281	271	1283	963	261		
Arrive On Green	0.18	0.18	0.69	0.69	0.69	0.69		
Sat Flow, veh/h	1774	1583	585	1863	1398	379		
Grp Volume(v), veh/h	52	310	304	544	0	956		
Grp Sat Flow(s),veh/h/ln	1774	1583	585	1863	0	1778		
Q Serve(g_s), s	2.2	16.0	29.4	11.6	0.0	32.6		
Cycle Q Clear(g_c), s	2.2	16.0	62.0	11.6	0.0	32.6		
Prop In Lane	1.00	1.00	1.00			0.21		
Lane Grp Cap(c), veh/h	315	281	271	1283	0	1225		
V/C Ratio(X)	0.16	1.10	1.12	0.42	0.00	0.78		
Avail Cap(c_a), veh/h	315	281	271	1283	0	1225		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	31.3	37.0	34.6	6.2	0.0	9.4		
Incr Delay (d2), s/veh	0.2	83.5	91.2	1.0	0.0	5.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	1.1	13.5	13.6	6.3	0.0	17.4		
LnGrp Delay(d),s/veh	31.6	120.5	125.8	7.2	0.0	14.4		
LnGrp LOS	C	F	F	A		B		
Approach Vol, veh/h	362			848	956			
Approach Delay, s/veh	107.8			49.7	14.4			
Approach LOS	F			D	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		68.0		22.0		68.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		62.0		16.0		62.0		
Max Q Clear Time (g_c+I1), s		64.0		18.0		34.6		
Green Ext Time (p_c), s		0.0		0.0		17.3		
Intersection Summary								
HCM 2010 Ctrl Delay			43.8					
HCM 2010 LOS			D					

HCM 2010 Signalized Intersection Summary




















18: Sawmill Pkwy. & Powell Rd.

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	172	318	122	137	293	67	278	931	130	361	1734	232
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	185	342	131	147	315	72	299	1001	140	388	1865	249
Adj No. of Lanes	2	2	1	1	2	0	2	2	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	1	1	1
Cap, veh/h	241	592	392	270	485	109	275	1602	796	718	1654	820
Arrive On Green	0.07	0.17	0.17	0.07	0.17	0.16	0.11	0.60	0.59	0.12	0.62	0.60
Sat Flow, veh/h	3442	3539	1583	1792	2899	654	3442	3539	1583	3476	3574	1599
Grp Volume(v), veh/h	185	342	131	147	192	195	299	1001	140	388	1865	249
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1792	1787	1766	1721	1770	1583	1738	1787	1599
Q Serve(g_s), s	5.3	8.9	6.8	6.8	10.1	10.3	8.0	18.0	3.7	5.8	46.3	7.0
Cycle Q Clear(g_c), s	5.3	8.9	6.8	6.8	10.1	10.3	8.0	18.0	3.7	5.8	46.3	7.0
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	592	392	270	299	296	275	1602	796	718	1654	820
V/C Ratio(X)	 0.77	0.58	0.33	0.54	0.64	0.66	1.09	0.62	0.18	0.54	1.13	0.30
Avail Cap(c_a), veh/h	241	849	507	270	429	424	275	1602	796	754	1654	820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	38.4	30.9	32.2	38.8	39.1	44.7	14.5	9.8	14.0	19.2	9.9
Incr Delay (d2), s/veh	13.9	0.9	0.5	2.3	2.3	2.5	79.1	1.8	0.5	0.7	65.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	4.4	3.0	3.5	5.2	5.2	6.8	9.1	1.7	2.8	37.5	3.2	
LnGrp Delay(d),s/veh	59.6	39.3	31.4	34.4	41.2	41.6	123.8	16.3	10.3	14.7	85.1	10.8
LnGrp LOS	E	D	C	C	D	D	F	B	B	B	F	B
Approach Vol, veh/h	658			534			1440			2502		
Approach Delay, s/veh	43.4			39.5			38.0			66.8		
Approach LOS	D			D			D			E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.0	21.7	14.0	51.3	13.0	21.7	15.0	50.3				
Change Period (Y+Rc), s	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0				
Max Green Setting (Gmax), s	33.0	23.0	7.0	38.0	6.0	23.0	9.0	36.0				
Max Q Clear Time (g_c+I), s	10.8	10.9	10.0	48.3	7.3	12.3	7.8	20.0				
Green Ext Time (p_c), s	0.0	3.6	0.0	0.0	0.0	3.4	0.2	14.6				
Intersection Summary												
HCM 2010 Ctrl Delay	52.9											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary
21: Sawmill Pkwy. & Big Bear Ave.

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	8	55	35	1	18	20	1183	73	57	2192	28
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1792	1792	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	20	9	59	38	1	19	22	1272	78	61	2357	30
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	6	6	6	2	2	2	2	2	2
Cap, veh/h	64	22	84	172	6	113	191	2749	168	398	2904	37
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	248	275	1065	1269	76	1437	146	3388	207	402	3579	45
Grp Volume(v), veh/h	88	0	0	38	0	20	22	663	687	61	1163	1224
Grp Sat Flow(s),veh/h/ln	1589	0	0	1269	0	1513	146	1770	1826	402	1770	1855
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	0.0	2.8	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.23		0.67	1.00		0.95	1.00		0.11	1.00		0.02
Lane Grp Cap(c), veh/h	169	0	0	172	0	119	191	1436	1481	398	1436	1505
V/C Ratio(X)	0.52	0.00	0.00	0.22	0.00	0.17	0.12	0.46	0.46	0.15	0.81	0.81
Avail Cap(c_a), veh/h	342	0	0	313	0	287	191	1436	1481	398	1436	1505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	0.0	0.0	43.8	0.0	43.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.0	0.6	0.0	0.7	1.2	1.1	1.0	0.8	5.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	0.0	1.0	0.0	0.5	0.1	0.4	0.4	0.1	2.0	2.1
LnGrp Delay(d),s/veh	47.3	0.0	0.0	44.4	0.0	43.7	1.2	1.1	1.0	0.8	5.0	4.9
LnGrp LOS	D			D		D	A	A	A	A	A	A
Approach Vol, veh/h	88			58			1372			2448		
Approach Delay, s/veh	47.3			44.1			1.1			4.9		
Approach LOS	D			D			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	86.1		13.9		86.1		13.9					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	69.0		19.0		69.0		19.0					
Max Q Clear Time (g_c+I1), s	2.0		7.3		2.0		4.8					
Green Ext Time (p_c), s	61.7		0.3		61.7		0.3					
Intersection Summary												
HCM 2010 Ctrl Delay				5.1								
HCM 2010 LOS				A								

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	10	0	0	13	0	1126	54	0	2163	1
Conflicting Peds, #/hr	0	0	8	0	0	2	0	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	210	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	0	0	11	0	0	14	0	1211	58	0	2326	1





















Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2941	3547	1171	2384	3548	612	2335	0	0	1213	0	0
Stage 1	2334	2334	-	1213	1213	-	-	-	-	-	-	-
Stage 2	607	1213	-	1171	2335	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	7	6	186	18	6	441	209	-	-	571	-	-
Stage 1	37	69	-	196	257	-	-	-	-	-	-	-
Stage 2	450	253	-	208	71	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	7	6	185	17	6	438	209	-	-	569	-	-
Mov Cap-2 Maneuver	7	6	-	17	6	-	-	-	-	-	-	-
Stage 1	37	69	-	196	257	-	-	-	-	-	-	-
Stage 2	434	253	-	196	71	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.7	13.5	0	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	209	-	-	185	438	569	-	-
HCM Lane V/C Ratio	-	-	-	0.058	0.032	-	-	-
HCM Control Delay (s)	0	-	-	25.7	13.5	0	-	-
HCM Lane LOS	A	-	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

HCM 2010 Signalized Intersection Summary
27: Sawmill Pkwy. & Seldom Seen Rd.





















5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	47	102	141	278	46	80	52	929	172	127	1704	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	51	110	152	299	49	86	56	999	185	137	1832	85
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	267	92	127	215	102	179	156	1569	290	347	1890	87
Arrive On Green	0.04	0.13	0.12	0.08	0.17	0.16	0.06	0.70	0.69	0.09	0.73	0.72
Sat Flow, veh/h	1774	709	980	1792	614	1077	1774	2983	552	1774	3446	159
Grp Volume(v), veh/h	51	0	262	299	0	135	56	592	592	137	934	983
Grp Sat Flow(s),veh/h/ln	1774	0	1690	1792	0	1691	1774	1770	1765	1774	1770	1835
Q Serve(g_s), s	2.4	0.0	13.0	8.0	0.0	7.3	1.4	18.1	18.3	3.4	48.0	50.4
Cycle Q Clear(g_c), s	2.4	0.0	13.0	8.0	0.0	7.3	1.4	18.1	18.3	3.4	48.0	50.4
Prop In Lane	1.00		0.58	1.00		0.64	1.00		0.31	1.00		0.09
Lane Grp Cap(c), veh/h	267	0	220	215	0	281	156	931	929	347	971	1006
V/C Ratio(X)	△ 0.19	0.00	1.19	1.39	0.00	0.48	0.36	0.64	0.64	0.39	0.96	0.98
Avail Cap(c_a), veh/h	278	0	220	215	0	281	224	931	929	393	971	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	0.0	43.8	38.3	0.0	38.1	22.7	9.8	10.0	11.2	12.6	13.0
Incr Delay (d2), s/veh	0.3	0.0	122.6	200.9	0.0	1.3	1.4	3.3	3.3	0.7	21.2	23.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.2	0.0	13.5	17.1	0.0	3.5	0.9	9.4	9.5	1.8	28.2	31.2
LnGrp Delay(d),s/veh	35.6	0.0	166.4	239.1	0.0	39.3	24.1	13.1	13.4	11.9	33.8	36.2
LnGrp LOS	D		F	F		D	C	B	B	B	C	D
Approach Vol, veh/h	313				434		1240				2054	
Approach Delay, s/veh	145.1				177.0		13.7				33.5	
Approach LOS	F				F		B				C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.4	57.6	13.0	18.0	9.2	59.8	9.4	21.6				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	8.0	49.0	7.0	12.0	7.0	50.0	4.0	15.0				
Max Q Clear Time (g_c+I1), s	5.4	20.3	10.0	15.0	3.4	52.4	4.4	9.3				
Green Ext Time (p_c), s	0.1	24.5	0.0	0.0	0.0	0.0	0.0	0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			51.5									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary

35: Sawmill Pkwy. & Drive 1

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (veh/h)	3	1	8	86	0	13	16	1178	74	6	50	2117
Number	7	4	14	3	8	18	5	2	12		1	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900		1863	1863
Adj Flow Rate, veh/h	3	1	9	92	0	14	17	1267	80		54	2276
Adj No. of Lanes	1	1	0	1	1	0	1	2	0		1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2
Cap, veh/h	184	14	128	188	0	140	201	2676	169		341	2873
Arrive On Green	0.09	0.09	0.09	0.09	0.00	0.09	0.79	0.79	0.79		1.00	1.00
Sat Flow, veh/h	1394	161	1447	1399	0	1583	163	3382	213		404	3630
Grp Volume(v), veh/h	3	0	10	92	0	14	17	662	685		54	1109
Grp Sat Flow(s),veh/h/ln	1394	0	1607	1399	0	1583	163	1770	1825		404	1770
Q Serve(g_s), s	0.2	0.0	0.6	6.5	0.0	0.8	2.4	12.5	12.5		2.5	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.6	7.0	0.0	0.8	2.4	12.5	12.5		15.1	0.0
Prop In Lane	1.00		0.90	1.00		1.00	1.00		0.12		1.00	
Lane Grp Cap(c), veh/h	184	0	142	188	0	140	201	1400	1444		341	1400
V/C Ratio(X)	0.02	0.00	0.07	0.49	0.00	0.10	0.08	0.47	0.47		0.16	0.79
Avail Cap(c_a), veh/h	284	0	257	288	0	253	201	1400	1444		341	1400
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	42.4	0.0	41.8	45.0	0.0	41.9	2.4	3.5	3.5		1.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	2.0	0.0	0.3	0.8	1.1	1.1		1.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.1	0.0	0.3	2.6	0.0	0.4	0.2	6.3	6.5		0.4	1.8
LnGrp Delay(d),s/veh	42.4	0.0	42.0	47.0	0.0	42.2	3.3	4.6	4.6		2.2	4.7
LnGrp LOS	D		D	D		D	A	A	A		A	A
Approach Vol, veh/h	13				106		1364				2331	
Approach Delay, s/veh	42.1				46.3		4.6				4.5	
Approach LOS	D				D		A				A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	85.1		14.9		85.1		14.9					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	72.0		16.0		72.0		16.0					
Max Q Clear Time (g_c+I1), s	14.5		3.0		17.1		9.0					
Green Ext Time (p_c), s	52.1		0.3		50.0		0.2					
Intersection Summary												
HCM 2010 Ctrl Delay			5.8									
HCM 2010 LOS			A									
Notes												
User approved ignoring U-Turning movement.												

HCM 2010 Signalized Intersection Summary 35: Sawmill Pkwy. & Drive 1

5/5/2015

Movement	SBR
Lane Configurations	
Volume (veh/h)	1
Number	16
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	1
Adj No. of Lanes	0
Peak Hour Factor	0.93
Percent Heavy Veh, %	2
Cap, veh/h	1
Arrive On Green	1.00
Sat Flow, veh/h	2
Grp Volume(v), veh/h	1168
Grp Sat Flow(s),veh/h/ln	1862
Q Serve(g_s), s	0.0
Cycle Q Clear(g_c), s	0.0
Prop In Lane	0.00
Lane Grp Cap(c), veh/h	1474
V/C Ratio(X)	0.79
Avail Cap(c_a), veh/h	1474
HCM Platoon Ratio	2.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	0.0
Incr Delay (d2), s/veh	4.4
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(-26165%),veh/ln	1.8
LnGrp Delay(d),s/veh	4.4
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	



A legacy of **experience**. A reputation for **excellence**.

2036 PM Peak Hour
No Build

HCM 2010 TWSC
4: Bunker Ln & Seldom Seen Rd.

5/4/2015

Intersection

Int Delay, s/veh 3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	25	515	42	33	556	26	43	0	37	25	1	21
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	175	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	27	554	45	35	598	28	46	0	40	27	1	23












Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	628	0	0	599	0	0	1327	1329	576	1335	1338	615
Stage 1	-	-	-	-	-	-	630	630	-	685	685	-
Stage 2	-	-	-	-	-	-	697	699	-	650	653	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	959	-	-	983	-	-	134	156	521	132	154	495
Stage 1	-	-	-	-	-	-	473	478	-	441	451	-
Stage 2	-	-	-	-	-	-	435	445	-	461	467	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	958	-	-	983	-	-	121	146	521	116	144	494
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	146	-	116	144	-
Stage 1	-	-	-	-	-	-	460	465	-	428	434	-
Stage 2	-	-	-	-	-	-	399	428	-	414	454	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.5	33.8	30.4
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	121	521	958	-	-	983	-	-	116	445
HCM Lane V/C Ratio Δ	0.382	0.076	0.028	-	-	0.036	-	-	0.232	0.053
HCM Control Delay (s)	52.1	12.5	8.9	-	-	8.8	-	-	45.2	13.5
HCM Lane LOS	F	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	1.6	0.2	0.1	-	-	0.1	-	-	0.8	0.2

























HCM 2010 Signalized Intersection Summary
7: Liberty Rd & Seldom Seen Rd

5/4/2015

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	190	337	336	852	545	192		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1845	1900		
Adj Flow Rate, veh/h	204	362	361	916	586	206		
Adj No. of Lanes	1	1	1	1	1	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	2	2	3	3		
Cap, veh/h	355	317	349	1242	870	306		
Arrive On Green	0.20	0.20	0.67	0.67	0.67	0.67		
Sat Flow, veh/h	1774	1583	682	1863	1305	459		
Grp Volume(v), veh/h	204	362	361	916	0	792		
Grp Sat Flow(s),veh/h/ln	1774	1583	682	1863	0	1764		
Q Serve(g_s), s	9.4	18.0	35.5	29.0	0.0	24.5		
Cycle Q Clear(g_c), s	9.4	18.0	60.0	29.0	0.0	24.5		
Prop In Lane	1.00	1.00	1.00			0.26		
Lane Grp Cap(c), veh/h	355	317	349	1242	0	1176		
V/C Ratio(X)	0.57	1.14	1.03	0.74	0.00	0.67		
Avail Cap(c_a), veh/h	355	317	349	1242	0	1176		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	32.5	36.0	31.3	9.8	0.0	9.1		
Incr Delay (d2), s/veh	2.3	95.2	57.0	2.4	0.0	1.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	4.8	16.2	14.2	15.6	0.0	12.2		
LnGrp Delay(d),s/veh	34.8	131.2	88.3	12.2	0.0	10.6		
LnGrp LOS	C	F	F	B		B		
Approach Vol, veh/h	566			1277	792			
Approach Delay, s/veh	96.4			33.7	10.6			
Approach LOS	F			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		66.0		24.0		66.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		60.0		18.0		60.0		
Max Q Clear Time (g_c+l1), s		62.0		20.0		26.5		
Green Ext Time (p_c), s		0.0		0.0		22.0		
Intersection Summary								
HCM 2010 Ctrl Delay			40.2					
HCM 2010 LOS			D					

HCM 2010 Signalized Intersection Summary
18: Sawmill Pkwy. & Powell Rd.




















5/4/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	532	473	137	299	389	194	433	2271	228	514	1404	185
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	572	509	147	322	418	209	466	2442	245	553	1510	199
Adj No. of Lanes	2	2	1	1	2	0	2	2	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	1	1	1
Cap, veh/h	373	531	435	245	328	163	430	1652	871	348	1579	853
Arrive On Green	0.11	0.15	0.15	0.10	0.14	0.13	0.13	0.47	0.46	0.10	0.44	0.43
Sat Flow, veh/h	3442	3539	1583	1792	2319	1147	3442	3539	1583	3476	3574	1599
Grp Volume(v), veh/h	572	509	147	322	321	306	466	2442	245	553	1510	199
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1792	1787	1679	1721	1770	1583	1738	1787	1599
Q Serve(g_s), s	13.0	17.1	8.9	12.0	17.0	17.0	15.0	56.0	9.9	12.0	49.0	8.0
Cycle Q Clear(g_c), s	13.0	17.1	8.9	12.0	17.0	17.0	15.0	56.0	9.9	12.0	49.0	8.0
Prop In Lane	1.00		1.00	1.00		0.68	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	373	531	435	245	253	238	430	1652	871	348	1579	853
V/C Ratio(X)	1.53	0.96	0.34	1.32	1.27	1.29	1.08	1.48	0.28	1.59	0.96	0.23
Avail Cap(c_a), veh/h	373	531	435	245	253	238	430	1652	871	348	1579	853
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	50.6	34.8	43.2	51.5	51.8	52.5	32.0	14.4	54.0	32.4	14.9
Incr Delay (d2), s/veh	253.5	28.9	0.5	167.8	148.2	156.7	67.6	218.7	0.8	279.2	14.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	10.5	3.9	20.5	18.8	18.2	11.2	77.5	4.5	19.2	27.3	3.6	
LnGrp Delay(d),s/veh	307.0	79.5	35.2	211.0	199.7	208.5	120.1	250.7	15.2	333.2	46.8	15.6
LnGrp LOS	F	E	D	F	F	F	F	F	B	F	D	B
Approach Vol, veh/h	1228				949		3153				2262	
Approach Delay, s/veh	180.2				206.4		213.1				114.1	
Approach LOS	F				F		F				F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	23.0	21.0	58.0	19.0	22.0	18.0	61.0				
Change Period (Y+Rc), s	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0				
Max Green Setting (Gmax), s	17.0	17.0	14.0	52.0	12.0	16.0	11.0	55.0				
Max Q Clear Time (g_c+ffl), s	19.1	17.0	51.0	15.0	19.0	14.0	58.0					
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			177.4									
HCM 2010 LOS			F									

HCM 2010 Signalized Intersection Summary

21: Sawmill Pkwy. & Big Bear Ave.

5/4/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	20	34	53	15	19	96	3042	138	33	1891	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1792	1792	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	22	37	57	16	20	103	3271	148	35	2033	46
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	6	6	6	2	2	2	2	2	2
Cap, veh/h	72	22	29	131	48	60	227	2903	130	60	2978	67
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.84	0.84	0.83	1.00	1.00	1.00
Sat Flow, veh/h	438	325	435	1280	718	897	198	3450	155	51	3538	80
Grp Volume(v), veh/h	102	0	0	57	0	36	103	1666	1753	35	1013	1066
Grp Sat Flow(s),veh/h/ln	198	0	0	1280	0	1615	198	1770	1835	51	1770	1849
Q Serve(g_s), s	5.4	0.0	0.0	0.0	0.0	2.6	20.5	101.0	101.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	6.3	0.0	2.6	20.5	101.0	101.0	101.0	0.0	0.0
Prop In Lane	0.42		0.36	1.00		0.56	1.00		0.08	1.00		0.04
Lane Grp Cap(c), veh/h	123	0	0	131	0	108	227	1489	1544	60	1489	1556
V/C Ratio(X)	0.83	0.00	0.00	0.43	0.00	0.33	0.45	1.12	1.14	0.58	0.68	0.69
Avail Cap(c_a), veh/h	123	0	0	131	0	108	227	1489	1544	60	1489	1556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.4	0.0	0.0	55.2	0.0	53.5	3.1	9.5	9.5	50.5	0.0	0.0
Incr Delay (d2), s/veh	36.3	0.0	0.0	2.3	0.0	1.8	6.4	62.9	69.4	35.3	2.5	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	0.0	2.0	0.0	1.2	1.5	73.2	78.7	1.7	1.0	1.1
LnGrp Delay(d),s/veh	93.7	0.0	0.0	57.5	0.0	55.3	9.5	72.4	79.0	85.8	2.5	2.5
LnGrp LOS	F			E		E	A	F	F	F	A	A
Approach Vol, veh/h		102			93			3522			2114	
Approach Delay, s/veh		93.7			56.6			73.8			3.9	
Approach LOS		F			E			E			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		106.0		14.0		106.0		14.0				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		100.0		8.0		100.0		8.0				
Max Q Clear Time (g_c+l1), s		103.0		10.0		103.0		8.3				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			48.6									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	10	0	0	35	0	2871	108	0	1856	6
Conflicting Peds, #/hr	0	0	8	0	0	2	0	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	210	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	0	0	11	0	0	38	0	3087	116	0	1996	6






















Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3553	5096	1009	4095	5099	1551	2010	0	0	3089	0	0
Stage 1	2007	2007	-	3089	3089	-	-	-	-	-	-	-
Stage 2	1546	3089	-	1006	2010	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	2	0	238	1	1	105	280	-	-	104	-	-
Stage 1	61	102	-	12	28	-	-	-	-	-	-	-
Stage 2	120	28	-	262	104	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	1	0	236	1	1	104	280	-	-	104	-	-
Mov Cap-2 Maneuver	1	0	-	1	1	-	-	-	-	-	-	-
Stage 1	61	101	-	12	28	-	-	-	-	-	-	-
Stage 2	76	28	-	250	103	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21	58.1	0	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	280	-	-	236	104	104	-	-
HCM Lane V/C Ratio	-	-	-	0.046	0.362	-	-	-
HCM Control Delay (s)	0	-	-	21	58.1	0	-	-
HCM Lane LOS	A	-	-	C	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.4	0	-	-





















HCM 2010 Signalized Intersection Summary
27: Sawmill Pkwy. & Seldom Seen Rd.

5/4/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	85	158	124	402	130	156	160	2302	444	187	1270	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	91	170	133	432	140	168	172	2475	477	201	1366	46
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	150	121	95	254	150	179	271	1638	306	149	1851	62
Arrive On Green	0.04	0.13	0.12	0.11	0.19	0.18	0.14	1.00	1.00	0.05	0.53	0.52
Sat Flow, veh/h	1774	970	759	1792	780	936	1774	2978	556	1774	3494	118
Grp Volume(v), veh/h	91	0	303	432	0	308	172	1438	1514	201	691	721
Grp Sat Flow(s),veh/h/ln	1774	0	1729	1792	0	1716	1774	1770	1765	1774	1770	1842
Q Serve(g_s), s	5.0	0.0	15.0	13.0	0.0	21.2	5.3	0.0	66.0	6.0	36.1	36.3
Cycle Q Clear(g_c), s	5.0	0.0	15.0	13.0	0.0	21.2	5.3	0.0	66.0	6.0	36.1	36.3
Prop In Lane	1.00		0.44	1.00		0.55	1.00		0.32	1.00		0.06
Lane Grp Cap(c), veh/h	150	0	216	254	0	329	271	973	971	149	938	976
V/C Ratio(X)	0.61	0.00	1.40	1.70	0.00	0.94	0.64	1.48	1.56	1.35	0.74	0.74
Avail Cap(c_a), veh/h	150	0	216	254	0	329	309	973	971	149	938	976
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	0.0	52.7	42.0	0.0	48.1	18.6	0.0	0.0	35.4	21.8	21.8
Incr Delay (d2), s/veh	6.9	0.0	206.4	331.4	0.0	33.5	3.5	220.5	257.0	195.9	5.2	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.9	0.0	19.5	25.4	0.0	13.2	3.0	59.6	69.3	13.0	19.0	19.8
LnGrp Delay(d),s/veh	52.5	0.0	259.1	373.5	0.0	81.5	22.1	220.5	257.0	231.3	26.9	26.8
LnGrp LOS	D		F	F		F	C	F	F	F	C	C
Approach Vol, veh/h		394			740			3124			1613	
Approach Delay, s/veh		211.4			252.0			227.3			52.3	
Approach LOS		F			F			F			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	71.0	18.0	20.0	13.4	68.6	10.0	28.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	65.0	12.0	14.0	10.0	60.0	4.0	22.0				
Max Q Clear Time (g_c+I1), s	8.0	68.0	15.0	17.0	7.3	38.3	7.0	23.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	21.6	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			181.2									
HCM 2010 LOS			F									

HCM 2010 Signalized Intersection Summary
35: Sawmill Pkwy. & Drive 1

5/4/2015

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	
Lane Configurations													
Volume (veh/h)	5	2	8	96	0	18	35	3070	29	3	21	1842	
Number	7	4	14	3	8	18	5	2	12		1	6	
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900		1863	1863	
Adj Flow Rate, veh/h	5	2	9	103	0	19	38	3301	31		23	1981	
Adj No. of Lanes	1	1	0	1	1	0	1	2	0		1	2	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93	
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2	
Cap, veh/h	177	28	127	185	0	151	236	2890	27		60	2920	
Arrive On Green	0.10	0.10	0.10	0.10	0.00	0.10	0.80	0.80	0.80		1.00	1.00	
Sat Flow, veh/h	1388	296	1332	1398	0	1583	218	3593	34		56	3630	
Grp Volume(v), veh/h	5	0	11	103	0	19	38	1623	1709		23	966	
Grp Sat Flow(s),veh/h/ln	1388	0	1628	1398	0	1583	218	1770	1857		56	1770	
Q Serve(g_s), s	0.4	0.0	0.7	8.7	0.0	1.3	4.9	96.5	96.5		0.0	0.0	
Cycle Q Clear(g_c), s	1.7	0.0	0.7	9.4	0.0	1.3	4.9	96.5	96.5		96.5	0.0	
Prop In Lane	1.00		0.82	1.00		1.00	1.00		0.02		1.00		
Lane Grp Cap(c), veh/h	177	0	156	185	0	151	236	1424	1494		60	1424	
V/C Ratio(X)	0.03	0.00	0.07	0.56	0.00	0.13	0.16	1.14	1.14		0.38	0.68	
Avail Cap(c_a), veh/h	230	0	217	238	0	211	236	1424	1494		60	1424	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		2.00	2.00	
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	50.5	0.0	49.4	53.7	0.0	49.7	2.8	11.7	11.7		48.3	0.0	
Incr Delay (d2), s/veh	0.1	0.0	0.2	2.6	0.0	0.4	1.5	72.1	73.3		17.5	2.6	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(-26165%),veh/ln	0.2	0.0	0.3	3.5	0.0	0.6	0.4	74.4	78.5		1.1	1.0	
LnGrp Delay(d),s/veh	50.5	0.0	49.6	56.3	0.0	50.0	4.2	83.9	85.0		65.8	2.6	
LnGrp LOS	D		D	E		D	A	F	F		E	A	
Approach Vol, veh/h	16				122				3370				2005
Approach Delay, s/veh	49.9				55.3				83.5				3.3
Approach LOS	D				E				F				A
Timer	1	2	3	4	5	6	7	8					
Assigned Phs	2		4		6		8						
Phs Duration (G+Y+Rc), s	102.5		17.5		102.5		17.5						
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0						
Max Green Setting (Gmax), s	92.0		16.0		92.0		16.0						
Max Q Clear Time (g_c+l1), s	98.5		3.7		98.5		11.4						
Green Ext Time (p_c), s	0.0		0.3		0.0		0.2						
Intersection Summary													
HCM 2010 Ctrl Delay			53.6										
HCM 2010 LOS			D										

HCM 2010 Signalized Intersection Summary

35: Sawmill Pkwy. & Drive 1

5/4/2015

Movement	SBR
Lane Configurations	1
Volume (veh/h)	16
Number	0
Initial Q (Qb), veh	1.00
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1900
Adj Sat Flow, veh/h/ln	1
Adj Flow Rate, veh/h	0
Adj No. of Lanes	0.93
Peak Hour Factor	2
Percent Heavy Veh, %	1
Cap, veh/h	1.00
Arrive On Green	2
Sat Flow, veh/h	1016
Grp Volume(v), veh/h	1862
Grp Sat Flow(s),veh/h/ln	0.0
Q Serve(g_s), s	0.0
Cycle Q Clear(g_c), s	0.00
Prop In Lane	1498
Lane Grp Cap(c), veh/h	0.68
V/C Ratio(X)	1498
Avail Cap(c_a), veh/h	2.00
HCM Platoon Ratio	1.00
Upstream Filter(l)	0.0
Uniform Delay (d), s/veh	2.5
Incr Delay (d2), s/veh	0.0
Initial Q Delay(d3),s/veh	1.0
%ile BackOfQ(-26165%),veh/ln	2.5
LnGrp Delay(d),s/veh	A
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	



A legacy of **experience**. A reputation for **excellence**.

2036 PM Peak Hour
Full Build

Intersection

Int Delay, s/veh 8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	25	521	70	39	559	26	83	0	48	25	1	21
Conflicting Peds, #/hr	0	0	1	0	0	0	0	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	175	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	0	0	0	0	0
Mvmt Flow	27	560	75	42	601	28	89	0	52	27	1	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	631	0	0	635	0	0	1365	1367	598	1378	1390	618
Stage 1	-	-	-	-	-	-	652	652	-	701	701	-
Stage 2	-	-	-	-	-	-	713	715	-	677	689	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	956	-	-	953	-	-	126	148	506	123	144	493
Stage 1	-	-	-	-	-	-	460	467	-	433	444	-
Stage 2	-	-	-	-	-	-	426	438	-	446	450	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	955	-	-	953	-	-	113	137	506	104	134	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	113	137	-	104	134	-
Stage 1	-	-	-	-	-	-	447	454	-	420	424	-
Stage 2	-	-	-	-	-	-	387	418	-	389	437	-












Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.6	71.9	33.7
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	113	506	955	-	-	953	-	-	104	439
HCM Lane V/C Ratio Δ	0.79	0.102	0.028	-	-	0.044	-	-	0.258	0.054
HCM Control Delay (s)	106	12.9	8.9	-	-	9	-	-	51.3	13.7
HCM Lane LOS	F	B	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	4.5	0.3	0.1	-	-	0.1	-	-	1	0.2

HCM 2010 Signalized Intersection Summary
7: Liberty Rd & Seldom Seen Rd

2014-2045

























5/5/2015

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Volume (veh/h)	196	348	342	852	545	195		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1845	1900		
Adj Flow Rate, veh/h	211	374	368	916	586	210		
Adj No. of Lanes	1	1	1	1	1	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	2	2	2	2	3	3		
Cap, veh/h	335	299	360	1263	879	315		
Arrive On Green	0.19	0.19	0.68	0.68	0.68	0.68		
Sat Flow, veh/h	1774	1583	679	1863	1298	465		
Grp Volume(v), veh/h	211	374	368	916	0	796		
Grp Sat Flow(s),veh/h/ln	1774	1583	679	1863	0	1763		
Q Serve(g_s), s	9.9	17.0	37.1	28.1	0.0	23.9		
Cycle Q Clear(g_c), s	9.9	17.0	61.0	28.1	0.0	23.9		
Prop In Lane	1.00	1.00	1.00			0.26		
Lane Grp Cap(c), veh/h	335	299	360	1263	0	1195		
V/C Ratio(X)	0.63	1.25	1.02	0.73	0.00	0.67		
Avail Cap(c_a), veh/h	335	299	360	1263	0	1195		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	33.6	36.5	30.6	9.2	0.0	8.5		
Incr Delay (d2), s/veh	3.7	137.4	53.0	2.1	0.0	1.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%),veh/ln	5.2	18.8	14.2	15.0	0.0	12.0		
LnGrp Delay(d),s/veh	37.3	173.9	83.6	11.3	0.0	9.9		
LnGrp LOS	D	F	F	B		A		
Approach Vol, veh/h	585			1284	796			
Approach Delay, s/veh	124.6			32.0	9.9			
Approach LOS	F			C	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		67.0		23.0		67.0		
Change Period (Y+Rc), s		6.0		6.0		6.0		
Max Green Setting (Gmax), s		61.0		17.0		61.0		
Max Q Clear Time (g_c+I1), s		63.0		19.0		25.9		
Green Ext Time (p_c), s		0.0		0.0		22.8		
Intersection Summary								
HCM 2010 Ctrl Delay			45.8					
HCM 2010 LOS			D					

HCM 2010 Signalized Intersection Summary
18: Sawmill Pkwy. & Powell Rd.

2014-2045




















5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	537	473	137	299	389	197	433	2314	228	520	1480	194
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1881	1881	1900	1863	1863	1863	1881	1881	1881
Adj Flow Rate, veh/h	577	509	147	322	418	212	466	2488	245	559	1591	209
Adj No. of Lanes	2	2	1	1	2	0	2	2	1	2	2	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	1	1	1
Cap, veh/h	373	531	422	245	327	164	402	1652	871	348	1608	866
Arrive On Green	0.11	0.15	0.15	0.10	0.14	0.13	0.12	0.47	0.46	0.10	0.45	0.44
Sat Flow, veh/h	3442	3539	1583	1792	2306	1158	3442	3539	1583	3476	3574	1599
Grp Volume(v), veh/h	577	509	147	322	323	307	466	2488	245	559	1591	209
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1792	1787	1677	1721	1770	1583	1738	1787	1599
Q Serve(g_s), s	13.0	17.1	9.0	12.0	17.0	17.0	14.0	56.0	9.9	12.0	52.9	8.3
Cycle Q Clear(g_c), s	13.0	17.1	9.0	12.0	17.0	17.0	14.0	56.0	9.9	12.0	52.9	8.3
Prop In Lane	1.00		1.00	1.00		0.69	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	373	531	422	245	253	238	402	1652	871	348	1608	866
V/C Ratio(X)	✓ 1.55	0.96	0.35	1.32	1.28	1.29	1.16	1.51	0.28	1.61	0.99	0.24
Avail Cap(c_a), veh/h	373	531	422	245	253	238	402	1652	871	348	1608	866
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	50.6	35.6	43.2	51.5	51.8	53.0	32.0	14.4	54.0	32.7	14.5
Incr Delay (d2), s/veh	259.4	28.9	0.5	167.8	150.9	159.4	96.5	231.1	0.8	286.8	20.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	10.5	4.0	11.4	19.0	18.4	12.0	80.3	4.5	19.6	30.5	3.8	
LnGrp Delay(d),s/veh	312.9	79.5	36.1	211.0	202.4	211.2	149.5	263.1	15.2	340.8	52.7	15.2
LnGrp LOS	F	E	D	F	F	F	F	F	B	F	D	B
Approach Vol, veh/h	1233			952			3199			2359		
Approach Delay, s/veh	183.5			208.2			227.5			117.7		
Approach LOS	F			F			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	23.0	20.0	59.0	19.0	22.0	18.0	61.0				
Change Period (Y+Rc), s	7.0	6.0	7.0	6.0	7.0	6.0	7.0	6.0				
Max Green Setting (Gmax), s	17.0	17.0	13.0	53.0	12.0	16.0	11.0	55.0				
Max Q Clear Time (g_c+1/4), s	19.1	19.1	16.0	54.9	15.0	19.0	14.0	58.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	184.7											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary
21: Sawmill Pkwy. & Big Bear Ave.

2014-2045

5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	20	34	53	15	19	96	3094	138	33	1982	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1792	1792	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	22	37	57	16	20	103	3327	148	35	2131	46
Adj No. of Lanes	0	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	6	6	6	2	2	2	2	2	2
Cap, veh/h	72	22	29	131	48	60	212	2906	128	60	2982	64
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.84	0.84	0.83	1.00	1.00	1.00
Sat Flow, veh/h	438	325	435	1280	718	897	180	3453	152	49	3543	76
Grp Volume(v), veh/h	102	0	0	57	0	36	103	1693	1782	35	1061	1116
Grp Sat Flow(s),veh/h/ln	198	0	0	1280	0	1615	180	1770	1835	49	1770	1849
Q Serve(g_s), s	5.4	0.0	0.0	0.0	0.0	2.6	25.4	101.0	101.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	0.0	6.3	0.0	2.6	25.4	101.0	101.0	101.0	0.0	0.0
Prop In Lane	0.42		0.36	1.00		0.56	1.00		0.08	1.00		0.04
Lane Grp Cap(c), veh/h	123	0	0	131	0	108	212	1489	1545	60	1489	1556
V/C Ratio(X)	0.83	0.00	0.00	0.43	0.00	0.33	0.49	1.14	1.15	0.58	0.71	0.72
Avail Cap(c_a), veh/h	123	0	0	131	0	108	212	1489	1545	60	1489	1556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.4	0.0	0.0	55.2	0.0	53.5	3.5	9.5	9.5	50.5	0.0	0.0
Incr Delay (d2), s/veh	36.3	0.0	0.0	2.3	0.0	1.8	7.8	70.3	77.0	35.3	2.9	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	0.0	0.0	2.0	0.0	1.2	1.7	76.2	81.9	1.7	1.2	1.2
LnGrp Delay(d),s/veh	93.7	0.0	0.0	57.5	0.0	55.3	11.3	79.8	86.5	85.8	2.9	2.9
LnGrp LOS	F			E		E	B	F	F	F	A	A
Approach Vol, veh/h	102			93			3578			2212		
Approach Delay, s/veh	93.7			56.6			81.2			4.2		
Approach LOS	F			E			F			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	106.0		14.0		106.0		14.0					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	100.0		8.0		100.0		8.0					
Max Q Clear Time (g_c+I1), s	103.0		10.0		103.0		8.3					
Green Ext Time (p_c), s	0.0		0.0		0.0		0.0					
Intersection Summary												
HCM 2010 Ctrl Delay				52.6								
HCM 2010 LOS				D								

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	10	0	0	52	0	2899	117	0	1890	6
Conflicting Peds, #/hr	0	0	8	0	0	2	0	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	210	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	0	0	0	2	2	2	2	2	2
Mvmt Flow	0	0	11	0	0	56	0	3117	126	0	2032	6





















Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3604	5162	1027	4143	5166	1566	2047	0	0	3119	0	0
Stage 1	2043	2043	-	3119	3119	-	-	-	-	-	-	-
Stage 2	1561	3119	-	1024	2047	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.5	6.5	6.9	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.5	4	3.3	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	2	0	232	1	0	102	271	-	-	101	-	-
Stage 1	58	98	-	12	27	-	-	-	-	-	-	-
Stage 2	117	26	-	256	100	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1	0	230	1	0	101	271	-	-	101	-	-
Mov Cap-2 Maneuver	1	0	-	1	0	-	-	-	-	-	-	-
Stage 1	58	97	-	12	27	-	-	-	-	-	-	-
Stage 2	52	26	-	244	99	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.4	77.9	0	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	271	-	-	230	101	101	-	-
HCM Lane V/C Ratio	-	-	-	0.047	0.554	-	-	-
HCM Control Delay (s)	0	-	-	21.4	77.9	0	-	-
HCM Lane LOS	A	-	-	C	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	2.6	0	-	-

HCM 2010 Signalized Intersection Summary
27: Sawmill Pkwy. & Seldom Seen Rd.






















2014-2045
5/5/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	85	160	126	423	133	174	163	2322	466	197	1281	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1881	1881	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	91	172	135	455	143	187	175	2497	501	212	1377	46
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	1	1	1	2	2	2	2	2	2
Cap, veh/h	134	153	120	194	142	186	269	1626	316	151	1850	62
Arrive On Green	0.04	0.16	0.15	0.08	0.19	0.18	0.14	1.00	1.00	0.05	0.53	0.52
Sat Flow, veh/h	1774	968	760	1792	741	969	1774	2957	574	1774	3495	117
Grp Volume(v), veh/h	91	0	307	455	0	330	175	1461	1537	212	696	727
Grp Sat Flow(s),veh/h/ln	1774	0	1729	1792	0	1710	1774	1770	1761	1774	1770	1842
Q Serve(g_s), s	5.0	0.0	19.0	9.0	0.0	23.0	5.4	0.0	62.5	6.0	36.7	36.8
Cycle Q Clear(g_c), s	5.0	0.0	19.0	9.0	0.0	23.0	5.4	0.0	62.5	6.0	36.7	36.8
Prop In Lane	1.00		0.44	1.00		0.57	1.00		0.33	1.00		0.06
Lane Grp Cap(c), veh/h	134	0	274	194	0	328	269	973	969	151	937	975
V/C Ratio(X)	0.68	0.00	1.12	2.34	0.00	1.01	0.65	1.50	1.59	1.40	0.74	0.75
Avail Cap(c_a), veh/h	134	0	274	194	0	328	291	973	969	151	937	975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	0.0	50.7	43.1	0.0	48.8	19.0	0.0	0.0	34.9	21.9	22.0
Incr Delay (d2), s/veh	13.0	0.0	91.2	619.2	0.0	51.4	4.5	230.7	269.1	216.5	5.3	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	1.1	0.0	16.0	33.4	0.0	15.5	3.2	62.4	72.4	14.1	19.2	20.0
LnGrp Delay(d),s/veh	55.5	0.0	141.9	662.2	0.0	100.2	23.6	230.7	269.1	251.4	27.3	27.2
LnGrp LOS	E		F	F		F	C	F	F	F	C	C
Approach Vol, veh/h	398				785		3173				1635	
Approach Delay, s/veh	122.1				426.0		237.9				56.3	
Approach LOS	F				F		F				E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	71.0	14.0	24.0	13.5	68.5	10.0	28.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	65.0	8.0	18.0	9.0	61.0	4.0	22.0				
Max Q Clear Time (g_c+I1), s	8.0	64.5	11.0	21.0	7.4	38.8	7.0	25.0				
Green Ext Time (p_c), s	0.0	0.5	0.0	0.0	0.1	22.1	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	205.3											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary
35: Sawmill Pkwy. & Drive 1

2014-2045

5/7/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (veh/h)	5	2	8	169	0	30	35	3096	55	3	37	1860
Number	7	4	14	3	8	18	5	2	12		1	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863		1863	1863
Adj Flow Rate, veh/h	5	2	9	182	0	32	38	3329	59		40	2000
Adj No. of Lanes	1	1	0	1	1	0	1	2	1		1	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2
Cap, veh/h	172	30	133	191	0	158	231	2831	1267		60	2904
Arrive On Green	0.10	0.10	0.10	0.10	0.00	0.10	1.00	1.00	1.00		1.00	1.00
Sat Flow, veh/h	1372	296	1332	1398	0	1583	214	3539	1583		53	3630
Grp Volume(v), veh/h	5	0	11	182	0	32	38	3329	59		40	975
Grp Sat Flow(s),veh/h/ln	1372	0	1628	1398	0	1583	214	1770	1583		53	1770
Q Serve(g_s), s	0.4	0.0	0.7	11.3	0.0	2.2	0.0	96.0	0.0		0.0	0.0
Cycle Q Clear(g_c), s	2.6	0.0	0.7	12.0	0.0	2.2	0.0	96.0	0.0		96.0	0.0
Prop In Lane	1.00		0.82	1.00		1.00	1.00		1.00		1.00	
Lane Grp Cap(c), veh/h	172	0	163	191	0	158	231	2831	1267		60	1416
V/C Ratio(X)	0.03	0.00	0.07	0.95	0.00	0.20	0.16	1.18	0.05		0.67	0.69
Avail Cap(c_a), veh/h	172	0	163	191	0	158	231	2831	1267		60	1416
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33		2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	50.8	0.0	48.9	55.9	0.0	49.6	0.0	0.0	0.0		48.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	51.2	0.0	0.6	1.5	83.1	0.1		45.9	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.2	0.0	0.3	8.7	0.0	1.0	0.1	32.7	0.0		2.1	1.1
LnGrp Delay(d),s/veh	50.9	0.0	49.1	107.1	0.0	50.2	1.5	83.1	0.1		93.9	2.8
LnGrp LOS	D		D	F		D	A	F	A		F	A
Approach Vol, veh/h	16				214				3426			
Approach Delay, s/veh	49.7				98.6				80.8			
Approach LOS	D				F				F			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	102.0		18.0		102.0		18.0					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	96.0		12.0		96.0		12.0					
Max Q Clear Time (g_c+I1), s	98.0		4.6		98.0		14.0					
Green Ext Time (p_c), s	0.0		0.4		0.0		0.0					
Intersection Summary												
HCM 2010 Ctrl Delay			54.0									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary
35: Sawmill Pkwy. & Drive 1

2014-2045
5/7/2015

Movement	SBR
Lane Configurations	
Volume (veh/h)	1
Number	16
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	1
Adj No. of Lanes	0
Peak Hour Factor	0.93
Percent Heavy Veh, %	2
Cap, veh/h	1
Arrive On Green	1.00
Sat Flow, veh/h	2
Grp Volume(v), veh/h	1026
Grp Sat Flow(s),veh/h/ln	1862
Q Serve(g_s), s	0.0
Cycle Q Clear(g_c), s	0.0
Prop In Lane	0.00
Lane Grp Cap(c), veh/h	1490
V/C Ratio(X)	0.69
Avail Cap(c_a), veh/h	1490
HCM Platoon Ratio	2.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	0.0
Incr Delay (d2), s/veh	2.6
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(-26165%),veh/ln	1.1
LnGrp Delay(d),s/veh	2.6
LnGrp LOS	A
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer

User approved ignoring U-Turning movement.