



WELLS + ASSOCIATES

MEMORANDUM

TO: Arthur J. Smith
George R. Phillips, AICP
Loudoun County Office of Transportation Services

CC: Roy Barnett
Van Metre Companies

Jeff Nein
Cooley Godward LLP

FROM: Michael J. Workosky, PTP
Joseph A. Winterer

DATE: January 26, 2009

SUBJECT: Stone Ridge Commercial
Traffic Impact Study Update;
Loudoun County, Virginia

INTRODUCTION

This memorandum presents an update to the Stone Ridge Commercial Traffic Impact Study (TIS), prepared by Wells + Associates, Inc., and dated July 19, 2006. The subject land parcels are contained within the existing Stone Ridge community, which is located south of U.S. Route 50 (John Mosby Highway) and west of Route 659 (Gum Spring Road), as shown on Figure I.

Stone Ridge Community Development IV, LLC, proposes to rezone and/or modify land parcels within the site that would result in a net nominal increase of 2,424 S.F. of commercial space. This would be achieved by increasing general office space by 115,508 S.F. and reducing light industrial space by 113,084 S.F. The total number of approved residential units (3,265 D.U.) would remain as currently approved. A summary of the proposed land use changes is provided in Table I.

The 2006 traffic report considered a significant increase in general office space converted from light industrial use and the addition of 307 residential condominiums. This study was the subject of referral comments provided by both the Loudoun County Office of Transportation Services (OTS) dated October 10, 2006 and the Virginia Department of Transportation (VDOT) dated February 16, 2007. Copies of these comments are contained in Appendix A.

Since the proposed development program has been significantly modified and reduced from the previous submission and background data in the area has changed, this updated traffic report serves as a response

to these comments. Further, since this report represents a continuation of the rezoning case submitted in 2006, it is not subject to the recently approved VDOT Chapter 527 requirements.

Access to the property would generally remain as currently provided by the existing and planned road system currently serving the Stone Ridge Community. South Point Drive (formerly Canary Grass Court) is proposed to be extended from Millstream Drive to Gum Spring Road (VA Route 659) south of U.S. Route 50 and would connect to the future West Spine Road. A concept plan for the project is shown in Figures 2A and 2B.

Consistent with the previously submitted traffic report, the site was assumed to be constructed in a single phase and complete by 2015. As specified in the traffic analysis scoping meeting, the most recent 2030 modeled traffic volumes from the current Loudoun County model have been included.

This updated traffic report includes the following items:

1. Collection of updated traffic counts at nine adjacent intersections.
2. Estimation of the number of weekday AM peak hour, and PM peak hour trips that would be generated by both the approved and proposed Stone Ridge development programs based on standard Institute of Transportation Engineers (ITE) trip generation rates.
3. Preparation of future traffic volumes for 2015 for both the currently approved and proposed development programs for Stone Ridge based on the updated existing traffic counts, traffic generated by other approved but incomplete development projects, and background traffic growth.
4. Calculation of total future levels of service at key intersections based on total future traffic forecasts, proposed traffic controls, and proposed intersection geometrics.
5. A review of the 2030 model traffic volumes provided by Loudoun County.
6. Review of the existing and proposed proffers.
7. Review and evaluation of the 2030 traffic model forecasts and land use assumptions provided by Loudoun County.

O:\PROJECTS\3001-3500\3088 STONE RIDGE COMMERCIAL\GRAPHICS\3088 - RPT GRAPHICS.DWG

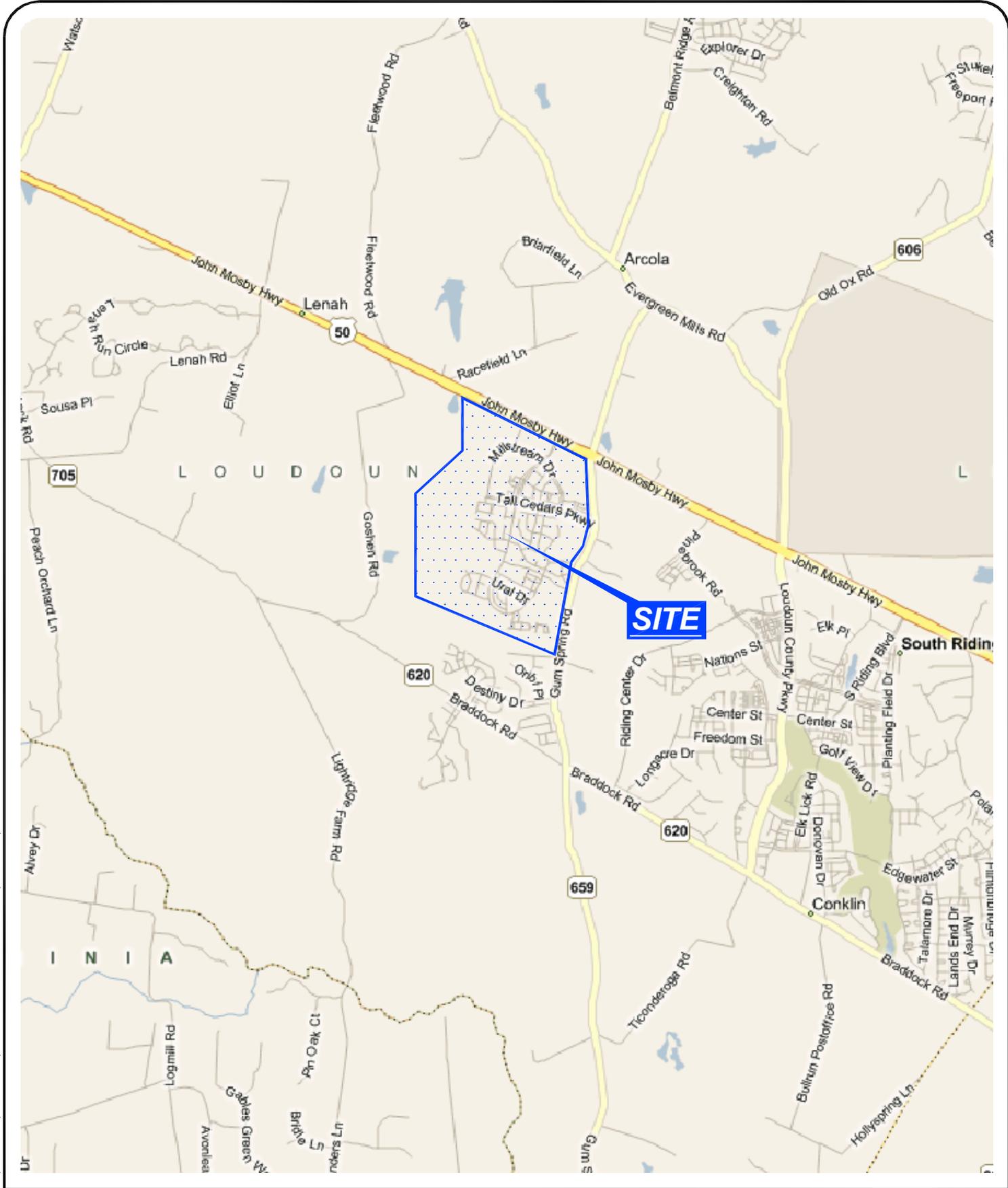


Figure 1
Site Location



JCP

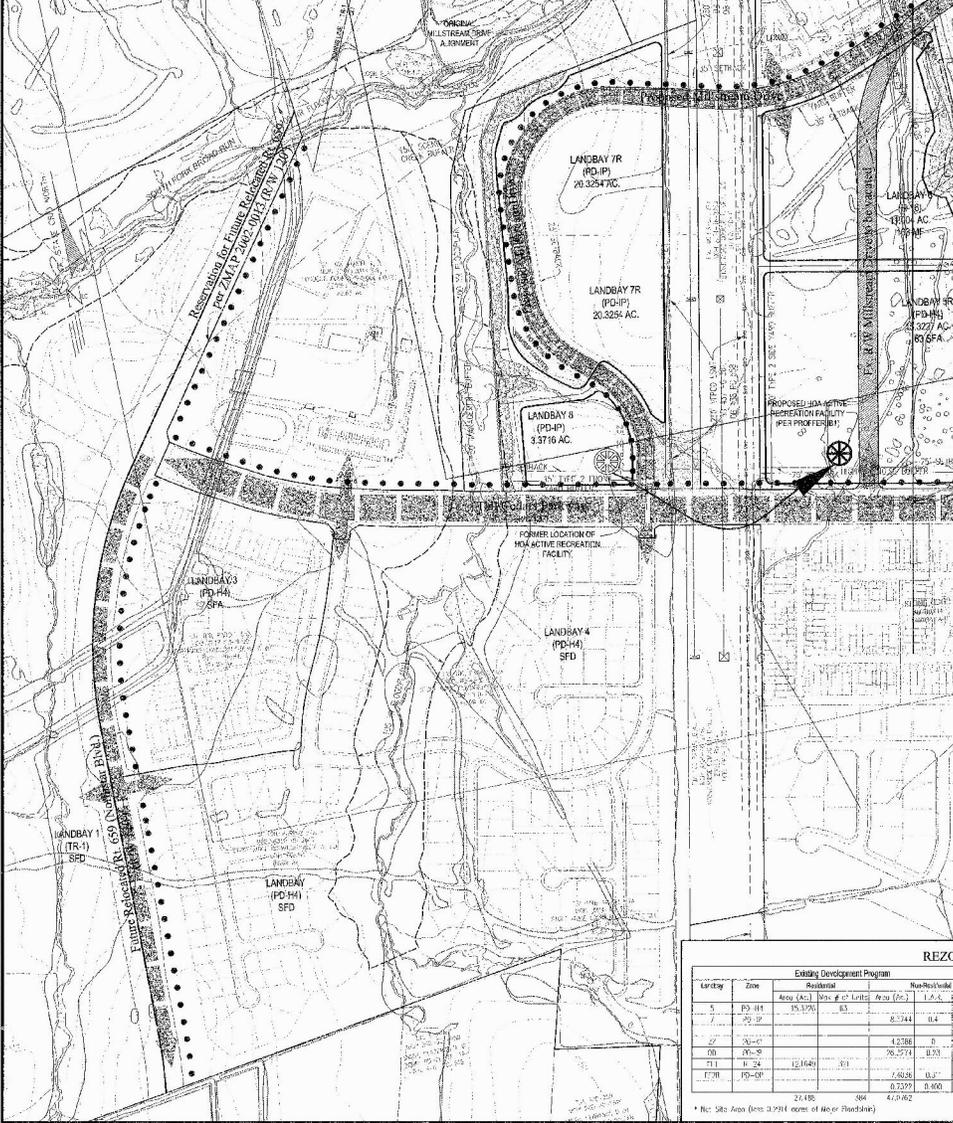
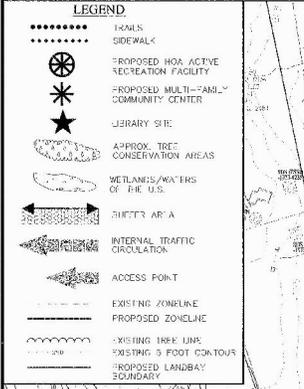
ACTIVE RECREATION SPACE : LANDBAY 5R
 (R-8 ZONING DISTRICT, PER Z.O. SECTION 7-80.1(2))
 TOTAL UNITS = 67
 PROPOSED ADUS @ 12.5K SF = 8
 PROPOSED MARKET UNITS = 59
LANDBAY 5R: 55 SFA UNITS
 REQUIRED ACTIVE RECREATION SPACE
 TO UNITS @ 5000 SF = 27500 SF
 55 SFA UNITS @ 200 SF/UNIT = 11000 SF
 REQUIRED ACTIVE REC. SPACE = 16500 SF = 0.37 AC**
 ** THE ACTIVE RECREATION SPACE REQUIREMENT WILL BE MET BY PROPOSED HOA ACTIVE RECREATION FACILITY.

ACTIVE RECREATION SPACE : LANDBAY 6
 (R-16 ZONING DISTRICT, PER Z.O. SECTION 7-100.3(C))
 TOTAL UNITS = 163
 PROPOSED ADUS @ 6.25K SF = 11
 PROPOSED MARKET UNITS = 152
LANDBAY 6: 152 MARKET RATE MF UNITS
 REQUIRED ACTIVE RECREATION SPACE
 TO UNITS @ 2400 SF = 39000 SF
 152 MF UNITS @ 250 SF/UNIT = 38000 SF
 REQUIRED ACTIVE REC. SPACE = 37000 SF = 0.77 AC**
 ** THE ACTIVE RECREATION SPACE REQUIREMENT WILL BE MET BY THE PROPOSED HOA ACTIVE RECREATION FACILITY IN LANDBAY 5R.

MINIMUM LOT REQUIREMENTS (PD-H4 ADMINISTERED AS R-8)
SINGLE FAMILY ATTACHED - LAND BAY 5R
 (SFA) (PER Z.O. SECTION 7-80.3)
 LOT SIZE 80 MINIMUM
 WIDTH 14 FEET FOR INTERIOR UNITS,
 22 FEET FOR END UNITS.
 FRONT YARD 10 FEET
 SIDE YARD 8 FEET, 0 FEET FOR INTERIOR UNITS
 REAR YARD 5 FEET
 LOT COVERAGE 40% MAXIMUM
 BUILDING HEIGHT 35 FEET

MINIMUM LOT REQUIREMENTS (R-16) - LAND BAY 6
MULTI-FAMILY
 (SFA) (PER Z.O. SECTION 7-100)
 LOT SIZE 80 MINIMUM
 WIDTH 14 FEET
 FRONT YARD 10 FEET
 SIDE YARD 10 FEET
 REAR YARD 25 FEET ON CORNER LOTS
 LOT COVERAGE 50% MAXIMUM
 BUILDING HEIGHT 35 FEET + 2'-0" (10') UP TO
SINGLE FAMILY ATTACHED
 (SFA) (PER Z.O. SECTION 7-100.3)
 LOT SIZE NO MINIMUM
 WIDTH 14 FEET FOR INTERIOR UNITS,
 22 FEET FOR END UNITS.
 FRONT YARD 10 FEET
 SIDE YARD 8 FEET
 REAR YARD 0 FEET FOR INTERIOR UNITS
 10 FEET
 LOT COVERAGE 50% MAXIMUM
 BUILDING HEIGHT 35 FEET
 LOT WIDTH 60 FEET MINIMUM
 LOT WIDTH 60 FEET MINIMUM
 MAX. DENSITY 10.7 DWELLING UNITS PER ACRE
 LENGTH WIDTH RATIO 7:1 MAXIMUM

- NOTES**
1. AFFORDABLE DWELLING UNITS WILL BE PROVIDED IN LANDBAYS 5R, 5R AND 6 AS REQUIRED BY THE ZONING ORDINANCE.
 2. PERMITS WILL BE OBTAINED FOR THE DISTURBANCES WITHIN THE JURISDICTIONAL AREAS OF THE SITE (SEE NOT 15, SHEET 1).
 3. SFA'S MAP FOR THE SITE CAN BE SEEN ON SHEETS 8 & 9.
 4. PUBLIC OPEN SPACE AREAS WILL BE OWNED AND MAINTAINED BY A HOMEOWNERS ASSOCIATION (HOA). THE HOA WILL BE ESTABLISHED PRIOR TO APPROVAL OF THE FIRST RECORD PLAN, IF A FORM APPROVED BY THE COUNTY.
 5. ALL SUBURBAN STREETS AND RIGHT-OF-WAYS WILL BE SIZED TO MEET COUNTY AND STATE STANDARDS.



COMPLIANT WITH ALL APPLICABLE ZONING REGULATIONS WILL BE DEMONSTRATED AT THE TIME OF SITE PLAN REVIEW.

MINIMUM LOT REQUIREMENTS FOR PD-IP
 (PD-IP PLANNED DEVELOPMENT - INDUSTRIAL PARK SECTION 4-500)
LAND BAYS 7R & 8
LOT REQUIREMENTS (SECTION 4-505)

- 4-505 Lot Requirements.**
- (A) **Size.** One (1) acre minimum, exclusive of major floodplain.
- (B) **Yards.**
- (1) **Adjacent to roads.** Except where a greater setback is required by Section 5-900, no building shall be permitted closer than thirty five (35) feet to the right-of-way from any road and no parking shall be permitted closer than twenty-five (25) feet to the right-of-way from any road. No outdoor storage, areas for collection of refuse, or loading space shall be permitted in such setbacks.
 - (2) **Adjacent to Agricultural and Residential Districts and Land Bays Allowing Residential Uses.** No building, outdoor storage, areas for collection of refuse, or loading area shall be permitted closer than seventy five (75) feet to any agricultural district, any existing or zoned residential district, or land bay allowing residential uses. No parking shall be permitted closer than sixty (60) feet to any such district and uses. No parking, outdoor storage, areas for collection of refuse, or loading space shall be permitted in areas between buildings and each agricultural district, existing or zoned residential districts, or land bays allowing residential uses where such uses are viable from the said agricultural and residential areas. When a PD-IP (a) parcel and/or facility is developed adjacent to an agricultural district, an existing or zoned residential district, or land bay allowing residential uses, which was zoned for agricultural or residential uses subsequent to the adoption of this zoning ordinance and subsequent to zoning of the subject property as "PD-IP," the setback required in (B)(3) below shall apply.
 - (3) **Adjacent to Other Nonresidential Districts.** Fifteen (15) feet for buildings, parking, outdoor storage, and loading area, except where a greater area is required by Section 5-1400. In the event that a single parcel is zoned for more than one non-residential zoning district, the applicable yard requirement shall be applied only at the property line and not at the zoning district line.
 - (4) **Yards Between Buildings.**
 - (5) **Where individual lots or building sites are provided, the minimum required yards between buildings on adjacent lots or building sites shall be thirty (30) feet.** Driveways, parking, and critical entrances may be within such yards. Covered walkways connecting buildings, or connecting buildings with parking areas, shall be permitted in such yards.
 - (6) **Where there is more than one building on an individual lot or building site, the spacing between such buildings shall be as required for fire protection, but if space is left between buildings, it shall be at least 25 feet in minimum dimension.** Covered walkways connecting buildings, or connecting buildings with parking areas are permitted in such yards and may traverse such space.

MINIMUM LOT REQUIREMENTS FOR CLI
 (CU COMMERCIAL LIGHT INDUSTRY SECTION 3-803)
LAND BAY 9 & A PORTION OF PD2B
LOT REQUIREMENTS (SECTION 3-805)

- 3-805 Lot Requirements.**
- (D) **Yards.**
- (1) **Adjacent to Roads.** Except where a greater setback is required by Section 5-900, thirty five (35) feet for building, twenty five (25) feet for parking.
 - (2) **Adjacent to Parcel Boundaries.**
 - (a) **With Other Nonresidential Districts.** 25 feet minimum, buildings, 10 feet minimum, parking lot, loading/unloading area, and areas for the collection or storage of refuse. The Zoning Administrator may waive the parking lot yard requirement when necessary to permit shared parking and access arrangements between users on individual parcels.
 - (b) **With Residential Districts.** 25 feet minimum. No building, parking lot, loading/unloading areas, outdoor storage, or areas for the collection or storage of refuse shall be permitted in any required yard adjacent to a residential zoning district.

LAND USE MIX TABULATIONS (For Suburban Policy Area)

SITE AREA = 315.42 AC	315.42 AC (R-1) = 773.16 AC	416.9 AC	(39.0%)
TOTAL AREA OF RESIDENTIAL		67.3 AC	(6.1%)
TOTAL AREA OF COMMERCIAL / BUSINESS		31.0 AC	(4.0%)
TOTAL AREA OF PARKS / OPEN SPACE		10.0 AC	(1.3%)
TOTAL AREA OF PARKS AND OPEN SPACE		17.0 AC	(2.0%)
TOTAL		773.16 AC	

* AREA OF PARKS AND OPEN SPACE DOES NOT INCLUDE IN SUBURBAN OPEN SPACE MAP IN THE LAND BAYS

REZONING AREA TABULATIONS

Landbay	Zone	Existing Development Program				Proposed Development Program					
		Area (Ac)	Dens. # of Units	Area (Ac)	Area (Ac)	Area (Ac)	Density	Area (Ac)	Area (Ac)		
5	PD-H4	15.17%	63	8,744	0.4	145,911	36	PD-H4	15.32%	63	
7	PD-IP			4,288	0	0	0	PD-IP			
8	PD-IP			78,274	0.73	307,110	0	PD-IP			
9	PD-IP			66.3	0.7	80,297	1129	PD-IP			
10	PD-IP			6,229	0.400	17,257		PD-IP			
11	PD-IP			27,439	0.8	47,862	500 (P)	PD-IP			

* Note: Site Area (Area of 3,298 acres of Major Floodplain)

Concept Development Plan-Exhibit A
STONE RIDGE COMMERCIAL
 ZMAP 2006-0011
 DULLES ELECTION DISTRICT
 LOUDOUN COUNTY, VIRGINIA
 SCALE: 1"=200'
 CL = 5'
 DATE: APRIL 2006

urban
 HUMAN-ORIENTED LANDSCAPE ARCHITECTURE AND STRATEGY
 Urban, Ltd.
 6000 Technology Court
 Chantilly, Virginia 20151
 Tel: 703.778.2100
 Fax: 703.778.1888
 www.urban-ltd.com

PLAN DATE: 4/7/06
 12/8/06
Figure 2A
Conceptual Site Plan
 Stone Ridge Commercial
 Loudoun County, Virginia
 WATTS & ASSOCIATES, INC.
 REVISIONS

MINIMUM LOT REQUIREMENTS FOR PD-OP

(PD-OP PLANNED DEVELOPMENT - OFFICE PARK SECTION 4-300)

LAND BAY FF2B

4-365 Lot Requirements.

- (A) **Size.** One (1) acre minimum, exclusive of major floodplain.
- (B) **Yards.**
 - (1) **Adjacent to roads.** Except where a greater setback is required by Section 5-900, no building shall be permitted closer than (35) feet to the right-of-way from any road and no parking shall be permitted closer than twenty-five (25) feet to the right-of-way from any road. No outdoor storage areas for collection of refuse, or loading space shall be permitted in such setbacks.
 - (2) **Adjacent to Agricultural and Residential Districts and Land Bays Allowing Residential Uses.** No building, outdoor storage, areas for collection of refuse, or loading areas shall be permitted closer than (100) feet to any agricultural district, any existing or zoned residential district, or land bay allowing residential uses. No parking shall be permitted closer than fifty (50) feet to any such area. No parking, outdoor storage, areas for collection of refuse, or loading space shall be permitted in areas between buildings and such agricultural districts, existing or planned residential districts, or land bays allowing residential uses where such uses are visible from said agricultural and residential areas. When a PD-OP lot, parcel and/or landbay is developed adjacent to an agricultural district, an existing or zoned residential district, or land bay allowing residential uses, which was zoned for agricultural or residential uses subsequent to the adoption of this zoning ordinance and subsequent to zoning of the subject property as PD-OP, the setback required in (B)(3) below shall apply.
 - (3) **Adjacent to Other Nonresidential Districts.** Fifteen (15) feet for buildings, parking, outdoor storage, and loading areas except where a greater set is required by Section 5-1400. In the event that a single parcel is zoned for more than one non-residential zoning district, the applicable yard requirement shall be applied only at the property line and not at the zoning district line.
 - (4) **Yards Between Buildings.**
 - (a) Where individual lots or building sites are provided, the minimum required yards between buildings on adjacent lots or building sites shall be thirty (30) feet. Driveways, parking, and covered entrances may be within such yards. Covered walkways connecting buildings, or connecting buildings with parking areas, shall be permitted in such yards.
 - (b) Where there is more than one building on an individual lot or building site, spacing between such buildings shall be as required for fire protection, but if space is left between buildings, it shall be at least (25) feet in minimum dimension. Covered walkways connecting buildings, or connecting buildings with parking areas are permitted in such yards and may traverse such space.

ZONING MODIFICATIONS

1. PD-OP District Yield Modifier, Section 4-305(B)(2). Buildings and parking areas in PD-OP Land Bay FF2B may be located no closer than twenty-five (25) feet to the adjacent R-24 zoning district lines adjacent to Land Bay FF1A. A permanent open space buffer twenty-five (25) feet in width with a Type 1 Buffer Yard shall be maintained within Land Bay FF2B adjacent to Land Bay FF1A.

ACTIVE RECREATION SPACE - LANDBAY FF1A

(R-24 ZONING DISTRICT, PER Z.O. SECTION 7-105(A)(1))

TOTAL UNITS = 158
 PROPOSED AMU'S @ 0.25XK = 19
 PROPOSED MARKET UNITS = 148

LANDBAY FF1A: 148 MARKET RATE MF UNITS

REQUIRED ACTIVE RECREATION SPACE:
 19 UNITS @ 2000 SF = 38000 SF
 158 MF UNITS @ 200 SF/UNIT = 31600 SF
 REQUIRED ACTIVE REC. SPACE = 37800 SF = 0.75 AC.***

*** THE ACTIVE RECREATION SPACE REQUIREMENT WILL BE MET BY THE PROPOSED MULTI-FAMILY COMMUNITY CENTER IN LANDBAY FF1A.

MINIMUM LOT REQUIREMENTS (R-24)

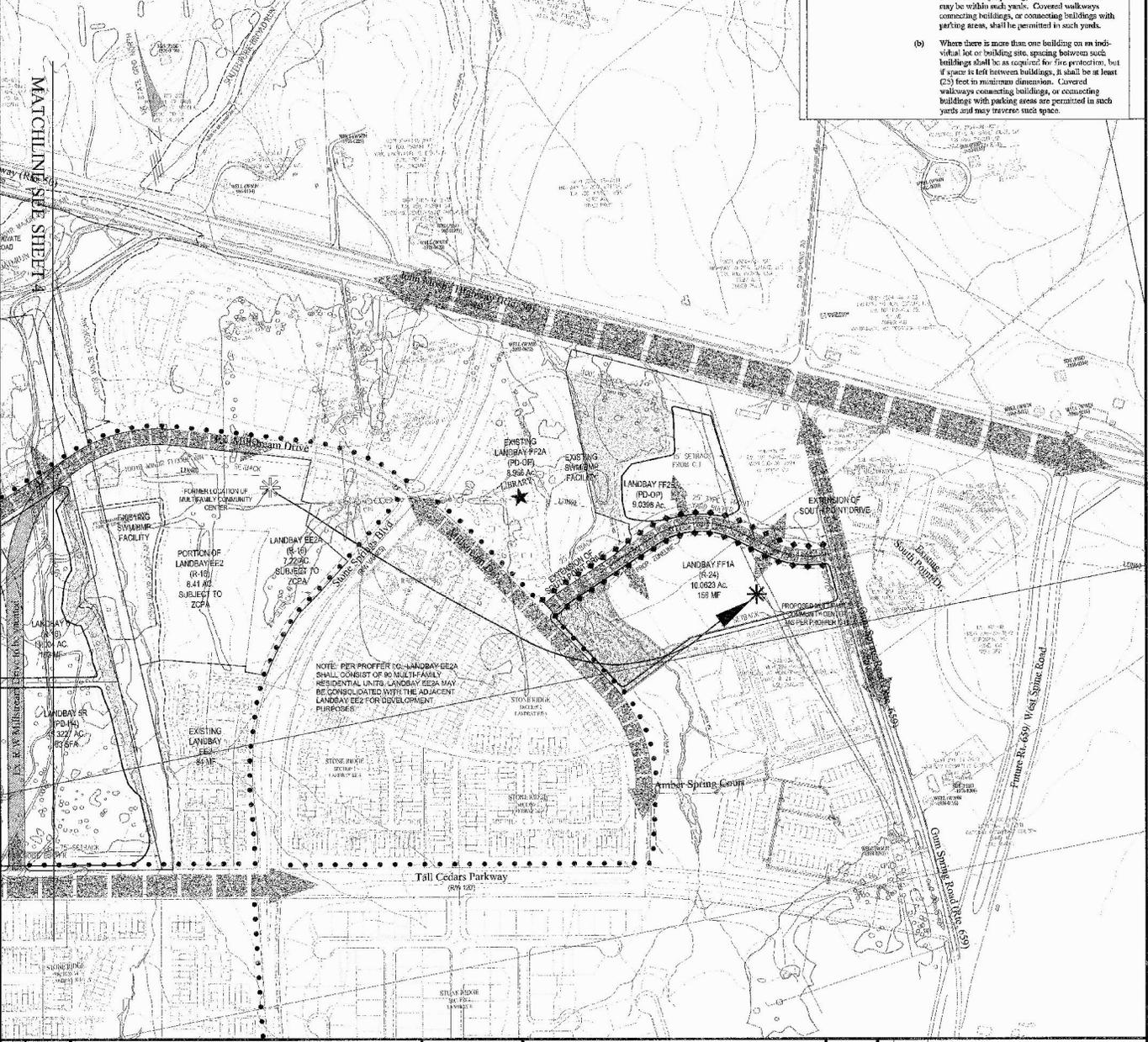
MULTI-FAMILY - LAND BAY FF1A
 (AS AMU PER Z.O. SECTION 7-1000)

LOT SIZE NO MINIMUM
 WIDTH 60 FEET
 FRONT YARD 25 FEET
 SIDE YARD 10 FEET
 REAR YARD 25 FEET ON CORNER LOTS
 REAR YARD 25 FEET
 10% COVERAGE 70% MAXIMUM
 BUILDING HEIGHT 35 FEET + 2(1) (2) UP TO 10
 10' WIDTH 55 FEET MAXIMUM
 10' WIDTH 50 FEET MINIMUM
 25% DWELLING UNITS PER ACRE
 LENGTH WIDTH RATIO 6:1 MAXIMUM
 MAX. UNITS PER BUILDING 64 DWELLING UNITS

COMPLIANCE WITH ALL APPLICABLE ZONING REGULATIONS WILL BE DEMONSTRATED AT THE TIME OF SITE PLAN REVIEW.

LEGEND

- ROAD'S
- SIDEWALK
- PROPOSED TRAIL, ACTIVE RECREATION FACILITY
- PROPOSED MULTI-FAMILY COMMUNITY CENTER
- LIBRARY SITE
- APPROX. TREE CONSERVATION AREAS
- WETLANDS/WATERS OF THE U.S.
- BUFFER AREA
- INTERNAL TRAFFIC CIRCULATION
- ACCESS POINT
- EXISTING ZONELINE
- PROPOSED ZONELINE
- EXISTING TREE LINE
- EXISTING 5 FOOT DISTURBANCE
- PROPOSED LANDBAY BOUNDARY



PROJECT
 FILE NO. RZ121935
 SHEET
 OF 17

Concept Development Plan-Exhibit A
STONE RIDGE COMMERCIAL
ZCPA 2006-0003/ZMAP 2006-0011
 DULLES ELECTON DISTRICT
 LOUDOUN COUNTY, VIRGINIA
 SCALE: 1"=200' CL-55 DATE: APRIL 2006

Urban, LLC
 4240 D Technology Court
 Chantilly, Virginia 20151
 Tel: 703.421.2300
 Fax: 703.421.2308
 www.urban-llc.com

PLAN DATE
 5/7/06
 12/8/06

Figure 2B
 Conceptual Site Plan

Stone Ridge Commercial
 Loudoun County, Virginia

WVA
 WVA Associates, Inc.

Table 1
 Stone Ridge Commercial
 Land Use Summary (1)(2)(3)

Land Use	Existing		Proposed		Total	
	Totals	Units	Totals	Units	Change	Units
Single-Family Detached	853	D.U.	853	D.U.	-	D.U.
Townhouse/Condominium	1,741	D.U.	1,741	D.U.	-	D.U.
Multi-Family	671	D.U.	671	D.U.	-	D.U.
Total Residential	3,265	D.U.	3,265	D.U.	-	D.U.
Retail	316,378	S.F.	316,378	S.F.	-	S.F.
Office (PD-OP/CLI)	282,557	S.F.	398,065	S.F.	115,508	S.F.
Light Industrial (PD-IP)	570,250	S.F.	457,166	S.F.	(113,084)	S.F.
Total Commercial/Employment	1,169,185	S.F.	1,171,609	S.F.	2,424	S.F.

Notes: (1) Total Change based on Concept Development Plan prepared by Urban Engineering, dated December 8, 2008.

(2) Proposed and Existing Totals based on the overall Approved Stone Ridge Development

(3) CLI was assumed as office for purpose of comparison and trip generation analysis.

Existing Traffic Counts and Levels of Service

Updated AM and PM peak hour traffic turning movement counts were conducted by Wells + Associates in 2008 from 6:00 to 9:00 AM and from 4:00 PM to 7:00 PM at the following intersections:

1. U.S. Route 50/Goshen Road.
2. U.S. Route 50/Stone Springs Boulevard.
3. U.S. Route 50/Gum Spring Road (VA Route 659).
4. U.S. Route 50/VA Route 606.
5. Millstream Drive (west)/Tall Cedars Parkway.
6. Stone Springs Boulevard/Tall Cedars Parkway.
7. Gum Spring Road/Tall Cedars Parkway.
8. Stone Springs Boulevard/Millstream Drive.
9. Tall Cedars Parkway/Sandbar Terrace.

The peak hour and Average Daily Traffic volumes are summarized on Figure 3 and presented in Appendix B. The existing lane use and traffic control in the site vicinity is shown on Figure 4.

Existing Levels of Service

Existing intersection levels of service for 2008 were calculated based on: (1) the existing traffic volumes shown on Figure 3, (2) the existing lane use and traffic control shown on Figure 4 and (3) the Highway Capacity Manual methodology. It is noted that separate turn lanes exist at some locations but are not currently in use. The results are summarized in Table 2 and presented in Appendix C, and indicate the following:

1. The side-street turning movements from southbound Goshen Road (Route 616) onto Route 50 currently operate at LOS "E" or "F" during both the AM and PM peak hours.
2. The Route 50/Stone Springs Boulevard signalized intersection operates at LOS "E" during the AM peak hour and LOS "C" during the PM peak hour.
3. The U.S. Route 50/Route 659 signalized intersection currently operate at LOS "E" during the AM peak hour and LOS "D" during the PM peak hour.
4. The U.S. Route 50/Route 606 (Loudoun County Parkway) intersection currently operates at LOS "F" during the AM peak hour and LOS "E" during the PM peak hour.
5. All of the turning movements at the stop controlled Stone Springs Boulevard/Millstream Drive intersection currently operate at acceptable levels of service during both the AM and PM peak hours.
6. The remaining unsignalized intersections on Tall Cedars Parkway at Route 659, Stone Springs Boulevard, and Millstream Drive currently operate at acceptable levels of service.

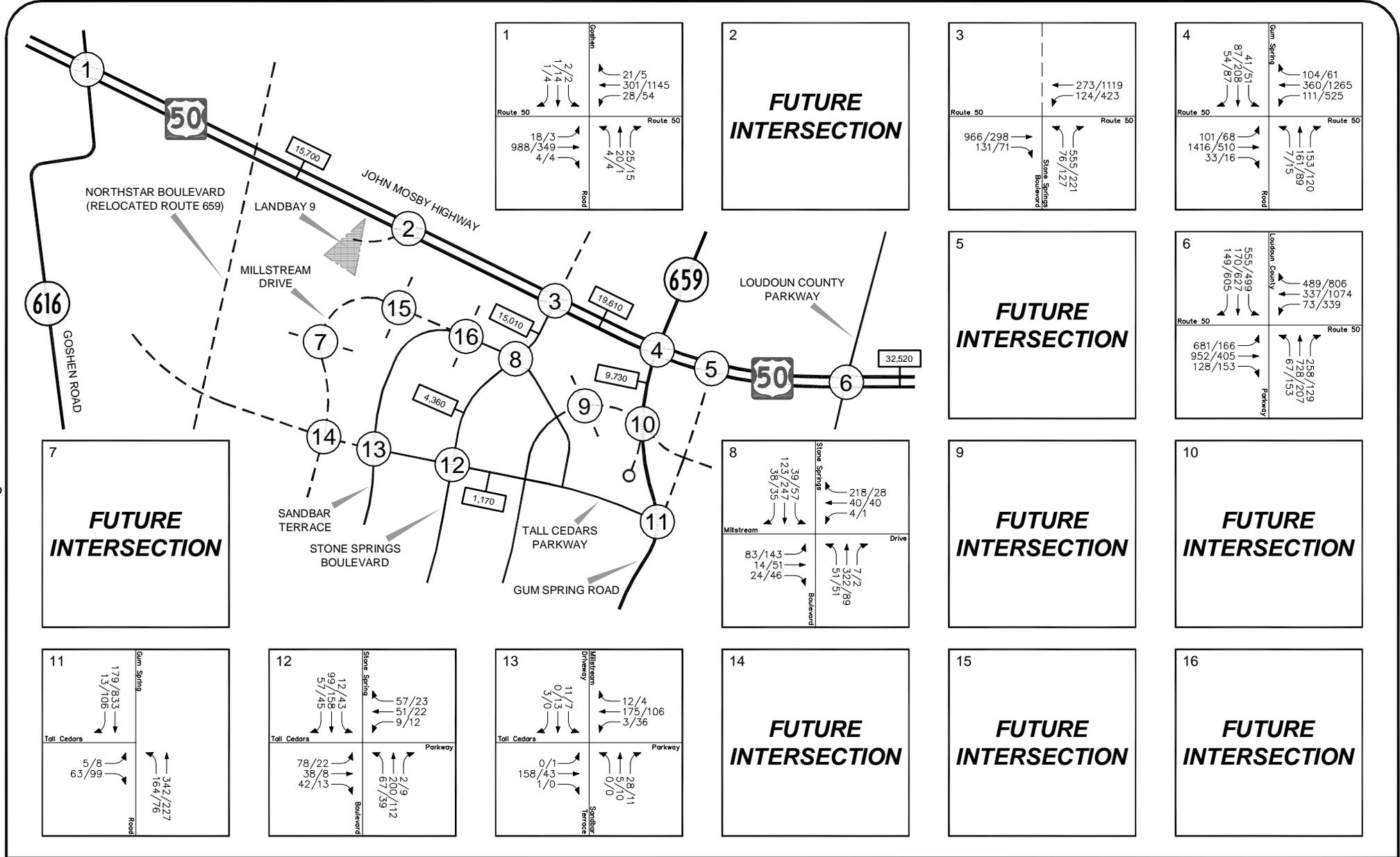


Figure 3
Existing Peak Hour Traffic Volumes

ADT Average Daily Trips

AM PEAK HOUR
PM PEAK HOUR
000/000



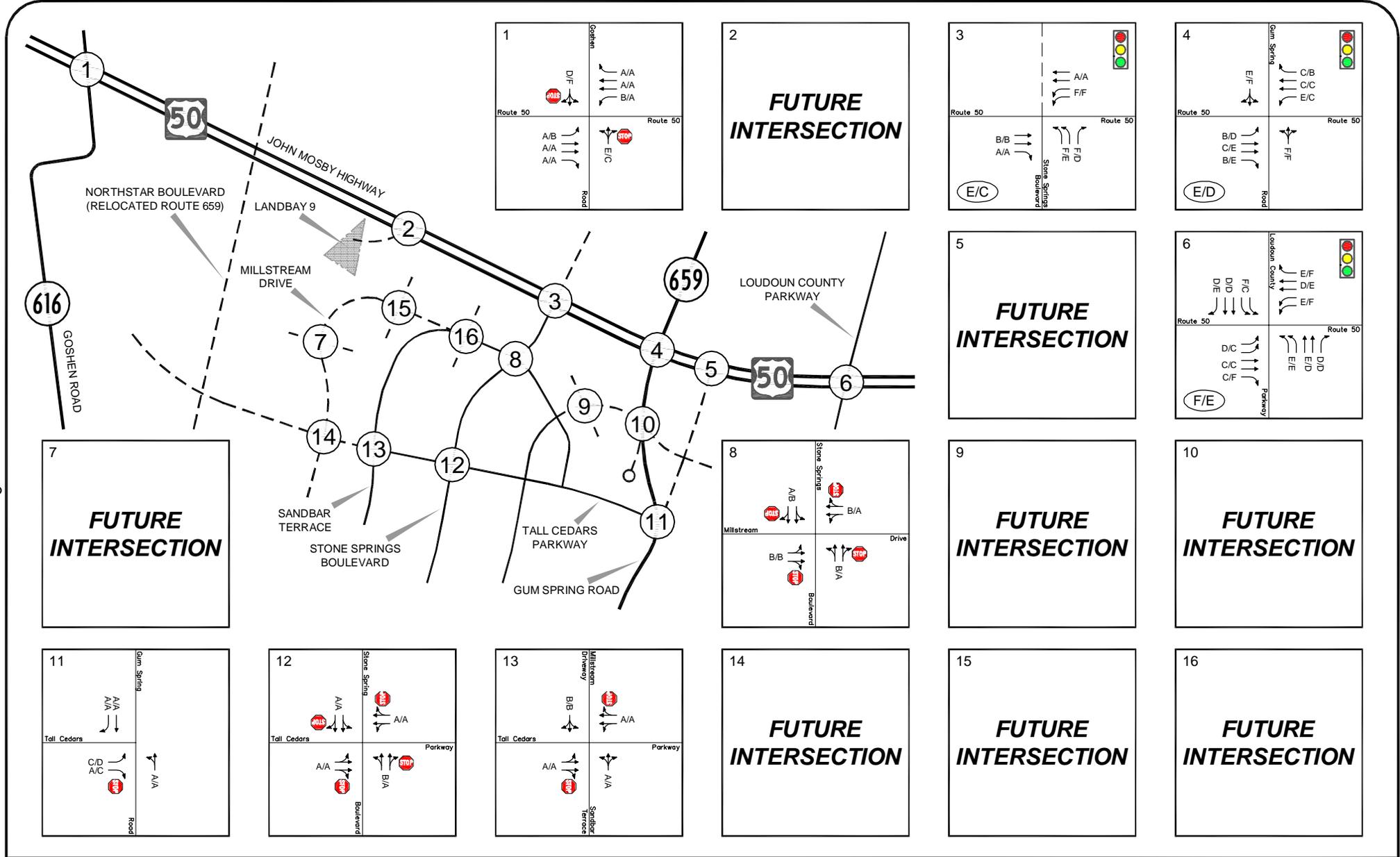


Figure 4
Existing Lane Use and Traffic Control and
Peak Hour Levels of Service

xx Levels of Service

(xx) Overall Levels of Service

← Represents One Travel Lane

Signalized Intersection

Stop Sign



North

Table 2-1
 Stone Ridge Commercial
 Intersection Level of Service Summary (1) (2) (3)

Intersection	Intersection Control	Critical Movement	2008		2015				
			Existing		Currently Approved Program		Proposed Program		
			AM	PM	AM	PM	AM	PM	
(1) U.S. Route 50/ Goshen Road	Stop Sign	EBL WBL NBLTR SBLTR	A [8.1] B [11.0] E [35.2] D [27.8]	B [11.7] A [8.3] C [17.6] F [58.9]	N/A		N/A		
	Signal Background Improvement: Install Signal, Add NBR, Optimize Timings (by others)	EBL EBT EBR WBL WBT WBR NBLT NBR SBLTR Overall	N/A		B (11.2) C (24.6) B (12.3) C (21.2) B (11.3) A (9.2) D (50.0) C (30.1) D (36.4) C (23.6)	B (16.7) B (14.3) B (11.1) A (7.9) B (19.2) A (6.9) D (42.9) C (27.3) D (39.3) B (19.0)	B (11.3) C (25.0) B (12.4) C (21.7) B (11.4) A (9.3) D (50.0) C (30.4) D (36.6) C (23.9)	B (16.8) B (14.2) B (11.0) A (7.9) B (19.2) A (6.8) D (43.0) C (27.4) D (39.4) B (19.0)	
(2) U.S. Route 50/ Racefield Ln/ Land Bay 9/INOVA Driveway	Signal	EBL EBT EBR WBL WBT WBR NBLTR SBL SBLT SBR Overall	N/A		A (6.6) B (17.5) A (7.9) B (18.5) A (8.7) A (8.1) D (51.0) D (49.5) D (49.6) D (40.8) B (15.8)	B (18.9) B (15.1) B (10.9) B (12.2) C (23.4) B (12.9) D (47.8) D (50.3) D (50.5) D (36.6) C (24.3)	A (6.6) B (18.0) A (8.0) B (18.4) A (8.8) A (8.2) D (51.1) D (49.5) D (49.6) D (40.6) B (16.1)	C (22.2) B (17.8) B (12.8) B (14.3) C (28.1) B (15.0) D (45.6) D (53.4) D (53.6) D (38.8) C (27.9)	
	Signal Background Improvement: Install Signal Add North and South Legs. Close Racefield Lane Median Break (by others)	EBT EBR WBL WBT WBR NBL NBR Overall	B (11.7) A (8.5) F (93.3) A (0.2) F (80.5) F (210.1) E (69.1)	B (10.1) A (9.4) F (92.7) A (0.5) E (64.7) D (42.1) C (27.0)	N/A		C (21.9) C (32.5) C (25.4) E (63.2) C (20.6) B (18.8) D (45.4) E (55.2) E (63.7) E (77.3) E (71.0) D (54.3) D (42.6)	E (74.5) D (46.5) D (39.2) E (59.6) D (48.6) C (26.7) E (62.7) E (56.4) D (47.2) E (70.1) E (77.6) D (51.5) D (53.6)	C (20.5) C (30.5) C (24.1) E (62.6) C (20.5) B (18.6) D (47.5) E (55.7) E (61.2) E (77.3) E (77.6) D (54.6) D (41.5)
(3) U.S. Route 50/ Stone Spings Blvd	Signal	EBT EBR WBL WBT NBL NBR Overall	B (11.7) A (8.5) F (93.3) A (0.2) F (80.5) F (210.1) E (69.1)	B (10.1) A (9.4) F (92.7) A (0.5) E (64.7) D (42.1) C (27.0)	N/A		N/A	N/A	
	Signal Background Improvement: Add SB Leg Optimize Timings, Add NB Lanes Add Through Lanes On Rt. 50.	EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR Overall	N/A		C (21.9) C (32.5) C (25.4) E (63.2) C (20.6) B (18.8) D (45.4) E (55.2) E (63.7) E (77.3) E (71.0) D (54.3) D (42.6)	E (74.5) D (46.5) D (39.2) E (59.6) D (48.6) C (26.7) E (62.7) E (56.4) D (47.2) E (70.1) E (77.6) D (51.5) D (53.6)	C (20.5) C (30.5) C (24.1) E (62.6) C (20.5) B (18.6) D (47.5) E (55.7) E (61.2) E (77.3) E (77.6) D (54.6) D (41.5)	E (75.4) D (45.7) D (38.6) E (59.2) D (48.6) C (28.7) E (65.9) E (57.1) D (46.8) E (70.1) E (79.8) D (51.5) D (53.7)	
(4) U.S. Route 50/ Gum Spring Rd (VA 659)/	Signal	EBL EBT EBR WBL WBT WBR NBLTR SBLTR Overall	B (12.0) C (29.8) B (13.3) E (57.0) C (22.6) C (20.8) F (247.4) E (78.2) E (58.7)	D (42.8) E (74.8) E (71.7) C (24.5) C (31.4) B (11.2) F (130.1) F (108.5) D (54.0)	N/A		N/A	N/A	
	Signal Background Improvement: Remove Signal Remove NB Leg, R/O Only (by others)	SBR	N/A		B (10.2)	A [9.8]	B [10.4]	A [9.7]	
(5) U.S. Route 50/ West Spine Road	Signal	EBT EBR WBL WBT NBL NBR Overall	N/A		E (56.6) A (9.1) D (52.3) A (8.5) D (54.1) D (38.4) D (40.6)	E (72.0) C (22.8) D (52.3) A (9.6) E (64.9) C (20.9) D (37.1)	E (62.2) A (9.9) E (55.7) A (8.3) D (54.1) D (39.0) D (44.0)	E (59.8) C (22.9) E (57.3) A (9.4) E (64.9) C (26.9) D (35.7)	
	Signal Background Improvement: Add Through Lane on Rt. 50, Optimize Timings (by others)	EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR Overall	D (54.4) C (32.8) C (22.9) E (65.8) D (46.9) F (98.6) E (65.8) E (62.3) D (45.6) F (528.2) D (41.9) D (40.8) F (110.7)	C (30.0) C (25.8) F (103.0) F (80.7) E (58.7) F (87.3) E (64.1) D (41.7) D (40.0) C (30.9) D (47.6) E (74.8) E (59.3)	F (181.5) D (38.1) C (27.0) F (85.9) E (68.8) F (296.8) F (87.4) F (279.1) F (82.9) F (342.7) D (46.2) D (49.9) F (152.9)	F (342.9) D (41.9) C (32.1) E (68.5) E (61.8) F (284.2) E (66.2) E (78.6) D (54.2) F (86.4) F (209.8) F (954.6) F (243.3)	F (181.9) D (38.2) C (27.0) F (85.9) E (69.6) F (296.8) F (87.4) F (279.1) F (82.9) F (342.7) D (46.2) D (50.3) F (153.8)	F (346.4) D (42.1) C (32.1) E (68.5) E (61.9) F (284.2) E (66.2) E (78.6) D (54.2) F (86.4) F (209.8) F (955.8) F (243.6)	
(6) U.S. Route 50/ Loudoun County Pkwy (Old Ox Road)	Signal	EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR Overall	D (54.4) C (32.8) C (22.9) E (65.8) D (46.9) F (98.6) E (65.8) E (62.3) D (45.6) F (528.2) D (41.9) D (40.8) F (110.7)	C (30.0) C (25.8) F (103.0) F (80.7) E (58.7) F (87.3) E (64.1) D (41.7) D (40.0) C (30.9) D (47.6) E (74.8) E (59.3)	F (181.5) D (38.1) C (27.0) F (85.9) E (68.8) F (296.8) F (87.4) F (279.1) F (82.9) F (342.7) D (46.2) D (49.9) F (152.9)	F (342.9) D (41.9) C (32.1) E (68.5) E (61.8) F (284.2) E (66.2) E (78.6) D (54.2) F (86.4) F (209.8) F (954.6) F (243.3)	F (181.9) D (38.2) C (27.0) F (85.9) E (69.6) F (296.8) F (87.4) F (279.1) F (82.9) F (342.7) D (46.2) D (50.3) F (153.8)	F (346.4) D (42.1) C (32.1) E (68.5) E (61.9) F (284.2) E (66.2) E (78.6) D (54.2) F (86.4) F (209.8) F (955.8) F (243.6)	
	Signal Background Improvement: Add Through Lane on Rt. 50, Optimize Timings (by others)	EBLR WBLR NBLTR SBLT	N/A		B [10.3] N/A A [7.2] N/A	B [11.5] N/A A [4.6] N/A	N/A A [9.9] N/A A [7.5]	N/A B [10.4] N/A A [6.3]	
(7) Millstream Dr/ Land Bay 7 Driveway	Stop Sign	EBLR WBLR NBLTR SBLT	N/A		B [10.3] N/A A [7.2] N/A	B [11.5] N/A A [4.6] N/A	N/A A [9.9] N/A A [7.5]	N/A B [10.4] N/A A [6.3]	

Notes: (1) Analyses based on Synchro 7.
 (2) Numbers in parentheses indicate average delay in seconds per vehicle for signalized intersections.
 (3) Numbers in brackets indicate average delay in seconds per vehicle for stop sign controlled intersections.

Table 2-2
 Stone Ridge Commercial
 Intersection Level of Service Summary (1) (2) (3)

Intersection	Intersection Control	Critical Movement	2008		2015			
			Existing		Currently Approved Program		Proposed Program	
			AM	PM	AM	PM	AM	PM
(8) Stone Springs Blvd/ Millstream Drive	Stop Sign 4-way	EBTL EBTR WBTL WBTR NBTL NBTR SBTL SBTR	B [10.7] A [8.3] A [8.7] B [11.9] B [12.2] B [10.6] A [10.0] A [9.3]	B [11.5] A [8.2] A [8.4] A [8.3] A [9.5] A [8.3] B [10.6] A [9.5]	N/A		N/A	
Background Improvement: Open existing turn lanes on Stone Springs, convert to two-way stop	Stop Sign 2-way	EBTLR WBTLR NBL SBL	N/A		F [*] F [456.6] A [8.9] B [10.6]	F [*] F [*] B [10.3] A [8.5]	F [*] F [*] A [8.7] B [10.9]	F [*] F [*] B [10.3] A [8.4]
(9) South Point Dr/ Site Office/Residential	Stop Sign	EBLTR WBTLR NBLTR SBTR	N/A		B [10.7] N/A A [7.9] A [0.0]	A [9.7] N/A A [6.7] A [0.0]	A [6.4] A [0.2] B [15.0] A [9.8]	A [3.1] A [2.0] B [13.9] B [10.4]
(10) Gum Spring Rd/ South Point Dr.	Stop Sign	EBT WBT	N/A		N/A		A [0.0] A [0.0]	A [0.0] A [0.0]
(11) Gum Spring Rd/West Spine Road/ Tall Cedars Pkwy	Stop Sign	EBL EBR NBTL	C [19.6] A [9.7] A [3.6]	D [31.3] C [21.6] A [4.1]	N/A		N/A	N/A
Background Improvement: Install Signal Realign with West Spine Road Add NB/SB Through Lane	Signal	EBL EBR NBLT SBT SBR Overall	N/A		C (20.5) B (19.0) B (14.0) A (4.9) A (1.4) B (12.8)	C (26.2) F (92.0) C (34.1) B (17.9) A (1.4) C (32.9)	C (20.8) B (19.7) B (13.5) A (4.7) A (1.4) B (12.4)	C (25.8) F (95.5) C (34.6) B (18.0) A (1.4) C (33.8)
(12) Stone Springs Blvd/ Tall Cedars Pkwy	Stop Sign 4-way	EBLT EBTR WBTL WBTR NBTL NBTR SBTL SBTR	A [9.6] A [7.9] A [8.4] A [8.2] B [10.1] A [8.6] A [8.4] A [8.3]	A [8.2] A [7.1] A [8.0] A [7.3] A [8.0] A [7.3] A [8.2] A [7.6]	N/A		N/A	
Background Improvement: Open existing turn lanes on Tall Cedars, convert to two-way stop	Stop Sign 2-way	EBL WBL NBLTR SBLTR	N/A		A [8.4] A [7.9] F [421.0] F [*]	A [7.8] A [7.8] F [*] F [*]	A [8.4] A [7.9] F [370.9] F [*]	A [7.8] A [7.8] F [*] F [*]
(13) Tall Cedars Pkwy/ Millstream Drive/Sandbar Terrace	Stop Sign	EBL WBL NBLTR SBLTR	A [0.0] A [0.3] A [9.4] B [10.9]	A [0.3] A [3.1] A [9.6] B [10.8]	A [0.9] A [0.5] C [16.2] C [18.7]	A [7.7] A [7.5] B [10.7] C [15.0]	A [8.2] A [7.9] C [15.7] C [17.8]	A [7.7] A [7.7] B [10.8] B [13.8]
(14) Tall Cedars Pkwy/ Millstream Extended	Stop Sign	WBL NBLTR SBLTR	N/A		N/A		A [7.6] B [10.1] B [12.1]	A [7.3] A [9.2] B [10.9]
(15) Millstream Extended/ Industrial Drive A	Stop Sign	EBLTR WBTLR NBLTR SBLTR	N/A		N/A		A [0.5] A [0.1] A [8.4] A [9.5]	A [0.4] A [1.4] A [9.0] A [9.8]
(16) Millstream Extended/ Industrial Drive B	Stop Sign	EBLTR WBTLR NBLTR SBLTR	N/A		N/A		A [0.0] A [0.1] A [8.5] A [9.8]	A [0.0] A [1.8] A [8.9] B [10.4]

Notes: (1) Analyses based on Synchro 7.
 (2) Numbers in parentheses indicate average delay in seconds per vehicle for signalized intersections.
 (3) Numbers in brackets indicate average delay in seconds per vehicle for stop sign controlled intersections.

Other Approved Developments

Overview. This traffic study includes traffic generated by 19 other approved development projects in the region, exclusive of the currently approved development program for the site. The following projects were considered in this traffic study:

1. Brambleton.
2. Kirkpatrick Farms.
3. South Riding.
4. Hutchinson Farm (Arcola Center).
5. South Village.
6. Pinebrook Village.
7. Braddock Corner.
8. Providence Glen.
9. Gum Spring Village Center.
10. South Riding Station.
11. Kirkpatrick Farms West.
12. CD Smith.
13. Glascock Field at Stone Ridge.
14. Marrwood Property.
15. Westport By-Right Property.
16. West Spine Plaza (proposed zoning).
17. Winsbury Homes.
18. Arcola School.
19. INOVA Property.

The level of development within each of the other approved projects listed above was estimated based on the ultimate approved development program, the projected pace of development in the study area as estimated in previous studies and updated information researched by Wells + Associates. The location of these other developments is shown on Figure 5. Trip generation estimates for background developments are contained in Appendix D.

Trip Assignments

The traffic anticipated to be generated by the other developments including both the approved and proposed Stone Ridge development programs were assigned to the study network according to distributions from previous studies, existing travel patterns and traffic counts, and local knowledge. These assignments are contained in Appendices E and F.

Growth Rate

Based on recent conversations with VDOT, a regional growth rate of 2.0 percent per year, compounded annually, was applied to all turning movements at the surrounding intersections for 2015 conditions.

Proposed Modifications to Regional Roads

Modifications to the regional road network were assumed as part of the Stone Ridge Commercial project development. These include:

1. Extension of South Point Drive (formerly Canary Grass Court) from Millstream Drive to existing Gum Spring Road (VA Route 659) and the future West Spine Road (by Stone Ridge Commercial).
2. Realign Millstream Drive west of Stone Springs Boulevard to access Land Bay 7 and connect to Tall Cedars Parkway west of the residential areas.
3. Intersection improvements to include a new traffic signal and turn lanes at the West Spine Road/U.S. Route 50 intersection through existing Stone Ridge proffers.
4. Access to Land Bay 9 from U.S. Route 50 opposite the future entrance to the Inova property.

Additional modifications to the internal road network are also contemplated as discussed later in this report.

The lane use and traffic control at the study area intersections for approved and proposed conditions are shown on Figures 6 and 7.

2030 Road Network

The 2030 road network associated with the Loudoun County long-range travel demand model assumes that the majority of roadways depicted in the Countywide Transportation Plan (CTP) are constructed.

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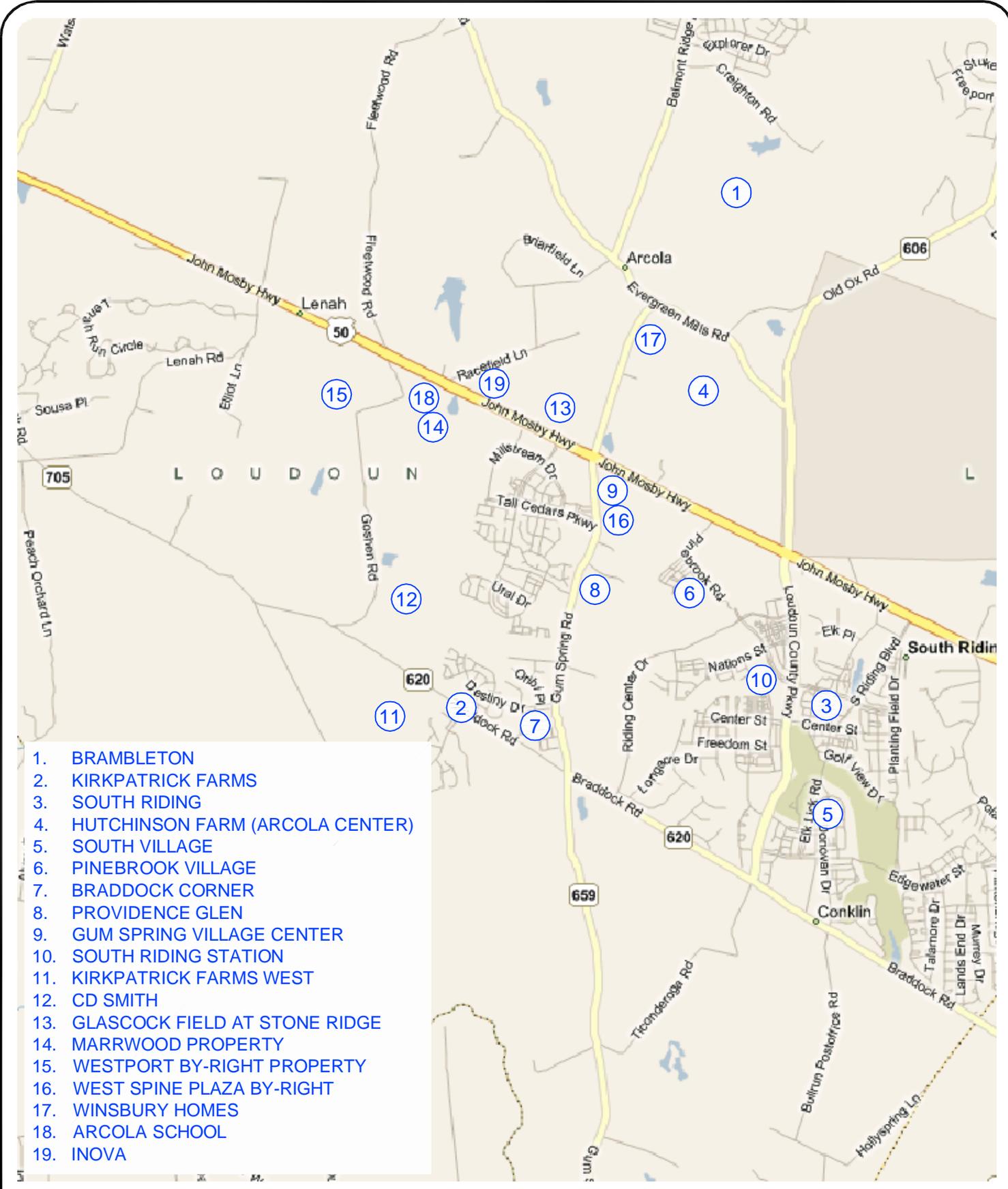
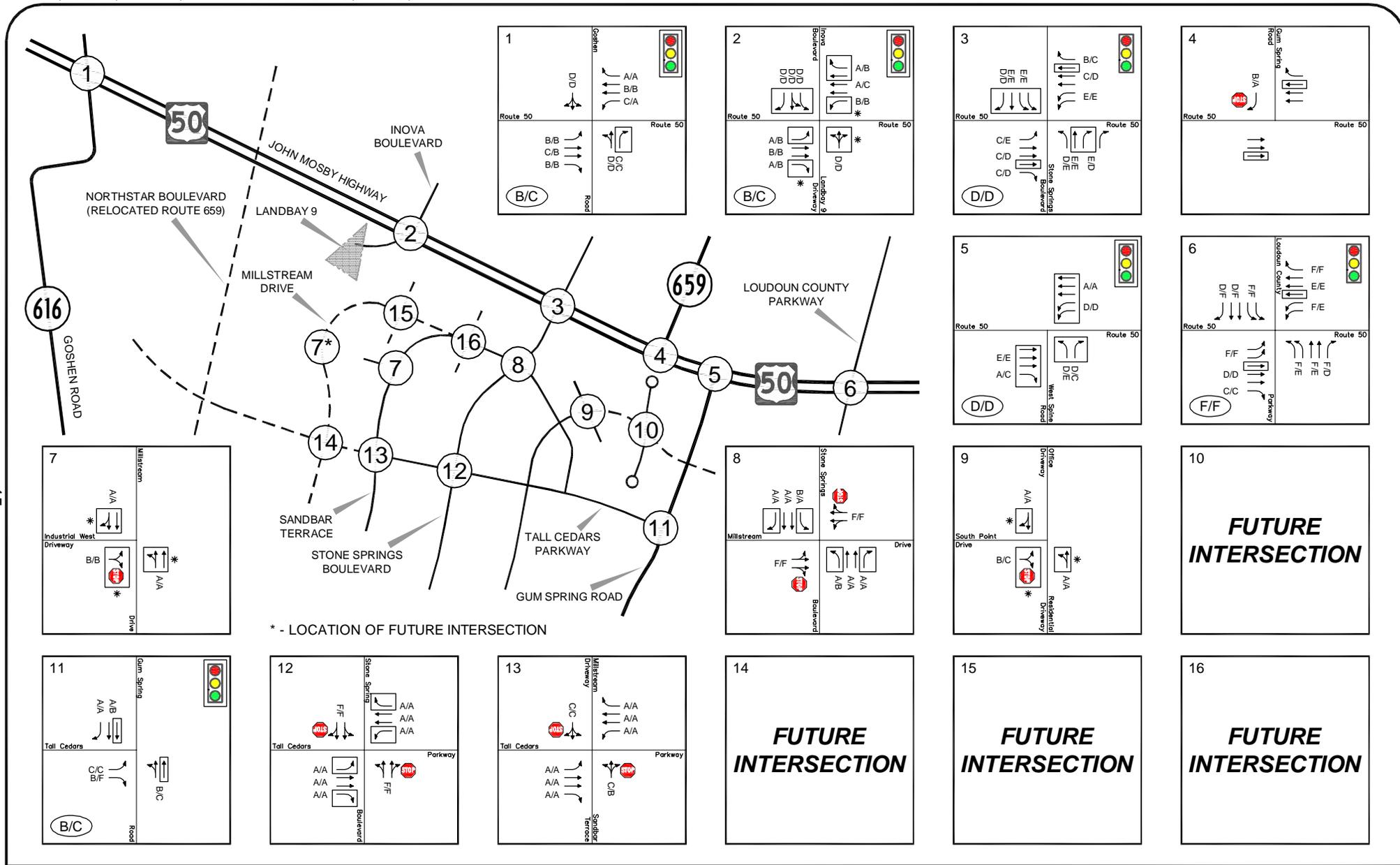


Figure 5
Location of Other Developments





* - LOCATION OF FUTURE INTERSECTION

Figure 6
 Future Approved Lane Use and Traffic Control and
 Peak Hour Levels of Service

xx Levels of Service
 (xx) Overall Levels of Service
 [] Proffered Improvement
 [] * Site Improvement

← Represents One Travel Lane
 Signalized Intersection
 Stop Sign



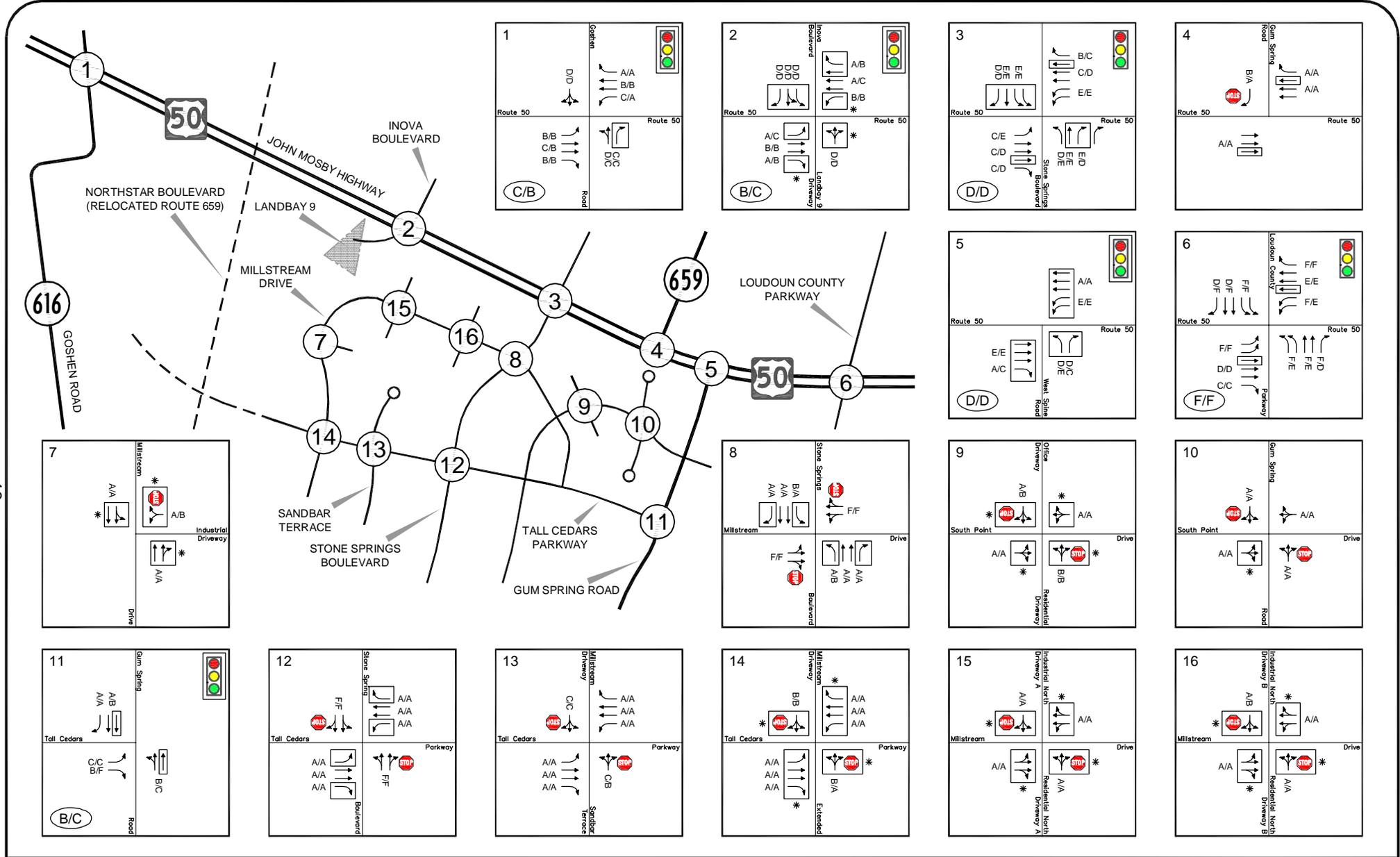


Figure 7
 Future Proposed Lane Use and Traffic Control and
 Peak Hour Levels of Service

xx Levels of Service
 (xx) Overall Levels of Service
 [] Proffered Improvement
 [*] Site Improvement

← Represents One Travel Lane
 Signalized Intersection
 Stop Sign



Site Trip Generation Analysis and Comparison

Stone Ridge Commercial would modify, rezone, or expand land parcels within the property that would result in a net nominal increase of 2,424 S.F. of commercial space. This would be achieved by increasing general office space by 115,508 S.F. and reducing light industrial space by 113,084 S.F. The total number of approved residential units (3,265) would remain as currently approved.

The number of net new vehicle trips that would be generated by the proposed development program changes was calculated by comparing the existing and proposed programs for Stone Ridge using the standard rates and equations published by the Institute of Transportation Engineers (ITE) Seventh Edition Manual.

Adjustments were made internal trips, transportation demand management measures, and passby trips, based on previously approved studies for Stone Ridge.

As shown in Table 3, the approved development program for Stone Ridge uses would generate 2,530 trips (1,231 in and 1,299 out) during the AM peak hour, 2,896 trips, (1,404 in and 1,492 out) during the PM peak hour, and 39,327 daily (24-trips).

The proposed development program would generate 2,601 trips (1,296 in and 1,305 out) during the AM peak hour, 2,934 trips, (1,408 in and 1,526 out) during the PM peak hour, and 39,658 daily (24-trips), as shown on Table 4. The proposed program has minimal impact on peak hour, peak direction trips since the shift in development density is proposed to be employment uses. The proposed development program would add only six (6) more outbound vehicle trips during the morning peak hour and only four (4) more inbound vehicle trips during the evening peak hour. The largest increase in peak hour vehicles (66 vehicles) would be realized for inbound traffic during the morning peak and outbound vehicles (34 vehicles) during the evening peak that is counter to peak commuter traffic flows.

A comparison of the approved and proposed development programs is summarized on Table 5 and the attached chart, and indicate that the proposed program would generate 71 (or 3.0 percent) *more* trips during the AM peak hour, and 38 (or 1.0 percent) *more* trips during the PM peak hour. A total of 331 (or 1.0 percent) *more* trips would be generated on a 24-hour basis.

Table 3
Stone Ridge Commercial
Stone Ridge Trip Generation Summary-Approved Program (1, 2)

Land Use	ITE Land Use Code	Amount	Units	AM Peak Hour			PM Peak Hour			Average Daily Traffic (3)
				IN	OUT	TOTAL	IN	OUT	TOTAL	
Residential										
Single-Family Detached	210	853	DU	152	455	607	465	273	738	8,530
Townhouse/Condominium	230	1,741	DU	86	422	508	419	207	626	15,147
Multi-Family	220	671	DU	67	266	333	251	135	387	4,183
Residential Subtotal		3,265	DU	305	1,142	1,447	1,135	615	1,750	27,860
Reduction for TDM (AM/PM) (4)	10%	10%		-	114	114	-	-	114	228
Internal to Office (AM/PM)	4%	8%		12	46	58	91	49	140	2,229
Internal to Retail (AM/PM)	1%	11%		6	10	16	104	96	201	2,154
Internal to Middle School	12%	3%		81	99	180	22	24	45	486
Internal to Elementary School	9%	0%		58	70	128	-	-	-	452
Internal to Library	0.2%	1%		1	2	2	6	6	12	95
Internal to Rec Center (North)	1%	1%		5	8	13	9	4	13	183
Internal to Rec Center (South)	0%	0%		1	2	3	2	1	3	46
Internal to Church	0%	0%		1	1	2	1	1	2	23
Internal to Day Care	3%	2%		18	20	38	21	19	40	238
Net New Residential Trips				122	771	893	766	416	1,182	21,728
Employment										
General Office (inside Stone Ridge)	710	227,167	S.F.	318	43	362	57	277	333	2,509
General Office (added Land Bay 9)	710	55,390	S.F.	103	14	117	24	117	141	846
Total Office		282,557	S.F.	421	57	479	81	393	474	3,355
General Industrial (Industrial Park)	130	109,250	S.F.							
General Industrial (Industrial Park)	130	461,000	S.F.							
General Industrial (Industrial Park) Total		570,250	S.F.	323	71	394	101	380	481	3,576
Employment Subtotal (excludes Land Bay 9)		797,417	S.F.	641	114	756	158	657	814	6,085
Reduction for TDM (AM/PM) (4)	10%	10%		64	-	64	-	66	66	130
Internal to Residential (AM/PM)	8%	17%		46	12	58	49	91	140	1,046
Internal to Retail (AM/PM)	1%	6%		6	10	16	70	64	134	365
Internal to Day Care (AM/PM)	5%	5%		18	20	38	21	19	40	238
Net New Employment Trips				507	72	580	18	417	435	4,306
Retail										
Retail	820	316,378	G.S.F.	191	122	312	643	696	1,339	14,357
New Trips	80%	75%		143	91	234	386	418	803	8,614
Pass-by (AM/PM) (5)	15%	15%		29	18	47	96	104	201	2,154
Internal to Residential (AM/PM) (6)	5%	15%		10	6	16	96	104	201	2,154
Internal to Office (AM/PM) (6)	5%	10%		10	6	16	64	70	134	1,436
School										
Middle School	522	1,200	Students	396	324	720	94	86	180	1,944
Internal from Residential (AM/PM) (7)	25%	25%		99	81	180	24	22	45	486
Net New Middle School Trips				297	243	540	71	65	135	1,458
Elementary School	520	700	Students	140	115	255	-	-	-	903
Internal from Residential (AM/PM)	50%	50%		70	58	128	-	-	-	452
Net New Elementary School Trips				70	58	128	-	-	-	452
Ancillary Uses										
Library	590	40,000	S.F.	34	13	47	115	125	240	1,898
Internal from Residential (AM/PM)	5%	5%		2	1	2	6	6	12	95
Net New Library Trips				32	12	45	109	119	228	1,803
Recreation Center (North)	495	8,000	S.F.	8	5	13	4	9	13	183
Internal from Residential (AM/PM) (8)	100%	100%		8	5	13	4	9	13	183
Net New Rec Center Trips				-	-	-	-	-	-	-
Recreation Center (South)	495	2,000	S.F.	2	1	3	1	2	3	46
Internal from Residential (AM/PM) (8)	100%	100%		2	1	3	1	2	3	46
Net New Rec Center Trips				-	-	-	-	-	-	-
Church	560	50,000	S.F.	19	17	36	17	16	33	456
Internal from Residential (AM/PM) (8)	5%	5%		1	1	2	1	1	2	23
Net New Church Trips				18	16	34	16	15	31	433
Day Care	565	12,000	S.F.	81	72	153	74	84	158	951
Internal from Residential (AM/PM) (8)	25%	25%		20	18	38	19	21	40	238
Internal from Office (AM/PM) (8)	25%	25%		20	18	38	19	21	40	238
Net New Day Care Trips				41	36	77	37	42	79	476
County Park	412	25	Acres	-	0	0	1	1	2	58
Internal from Residential (AM/PM) (8)	0%	0%		-	-	-	-	-	-	-
Net New Rec Center Trips				-	0	0	1	1	2	58
Total Approved Site Trip Generation				1,231	1,299	2,530	1,404	1,492	2,896	39,327

Notes: (1) Trip generation based on Institute of Transportation Engineers Trip Generation, 7th Edition, consistent with previous studies.
(2) Development densities based on site plans provided by Urban Engineering and include Land Bay 9.
(3) Average Daily Traffic for SFDU 10/D.U. and SFA of 8.7/D.U. based on County rate.
(4) Transportation Systems Management (TSM) reduction applied to peak hour, peak direction trips as assumed in original 1995 and August 2005 traffic studies.
(5) Pass-by rate utilized by VDOT and assumed in original 1995 and August 2005 traffic studies.
(6) Rate based on original June 1995 traffic study.
(7) Rate based on information provided by Loudoun County Public Schools.
(8) Rate based on information provided by Van Metre Companies.

Table 4
Stone Ridge Commercial
Stone Ridge Trip Generation Summary-Proposed Program (1, 2)

Land Use	ITE Land Use Code	Amount	Units	AM Peak Hour			PM Peak Hour			Average Daily Traffic (3)
				IN	OUT	TOTAL	IN	OUT	TOTAL	
Residential										
Single-Family Detached	210	853	DU	152	455	607	465	273	738	8,530
Townhouse/Condominium	230	1,741	DU	86	422	508	419	207	626	15,147
Multi-Family	220	671	DU	67	266	333	251	135	387	4,183
Residential Subtotal		3,572	DU	305	1,142	1,447	1,135	615	1,750	27,860
Reduction for TDM (AM/PM) (4)	10%	10%		-	114	114	114	-	114	228
Internal to Office (AM/PM)	4%	8%		12	46	58	91	49	140	2,229
Internal to Retail (AM/PM)	1%	11%		6	10	16	104	96	201	2,154
Internal to Middle School	12%	3%		81	99	180	22	24	45	486
Internal to Elementary School	9%	0%		58	70	128	-	-	-	452
Internal to Library	0.2%	1%		1	2	2	6	6	12	95
Internal to Rec Center (North)	1%	1%		5	8	13	9	4	13	183
Internal to Rec Center (South)	0%	0%		1	2	3	2	1	3	46
Internal to Church	0%	0%		1	1	2	1	1	2	23
Internal to Day Care	3%	2%		18	20	38	21	19	40	238
Net New Residential Trips				122	771	893	766	416	1,182	21,728
Employment										
General Office (inside Stone Ridge)	710	342,675	S.F.	442	60	502	79	384	463	3,444
General Office (added Land Bay 9)	710	55,390	S.F.	103	14	117	24	117	141	846
Total Office		398,065	S.F.	545	74	619	103	501	603	4,290
General Industrial (Industrial Park)	130	111,675	S.F.							
General Industrial (Industrial Park)	130	345,491	S.F.							
General Industrial (Industrial Park) Total		457,166	S.F.	272	60	332	83	311	394	3,015
Employment Subtotal (excludes Land Bay 9)		799,841	S.F.	714	120	834	162	695	857	6,459
Reduction for TDM (AM/PM) (4)	10%	10%		71	-	71	-	70	70	141
Internal to Residential (AM/PM)	7%	16%		46	12	58	49	91	140	1,056
Internal to Retail (AM/PM)	1%	6%		6	10	16	70	64	134	388
Internal to Day Care (AM/PM)	5%	5%		18	20	38	21	19	40	238
Net New Employment Trips				573	78	651	22	452	474	4,637
Retail										
Retail	820	316,378	G.S.F.	191	122	312	643	696	1,339	14,357
New Trips	80%	75%		143	91	234	386	418	803	8,614
Pass-by (AM/PM) (5)	15%	15%		29	18	47	96	104	201	2,154
Internal to Residential (AM/PM) (6)	5%	15%		10	6	16	96	104	201	2,154
Internal to Office (AM/PM) (6)	5%	10%		10	6	16	64	70	134	1,436
School										
Middle School	522	1,200	Students	396	324	720	94	86	180	1,944
Internal from Residential (AM/PM) (7)	25%	25%		99	81	180	24	22	45	486
Net New Middle School Trips				297	243	540	71	65	135	1,458
Elementary School	520	700	Students	140	115	255	-	-	-	903
Internal from Residential (AM/PM)	50%	50%		70	58	128	-	-	-	452
Net New Elementary School Trips				70	58	128	-	-	-	452
Accessory Uses										
Library	590	40,000	S.F.	34	13	47	115	125	240	1,898
Internal from Residential (AM/PM)	5%	5%		2	1	2	6	6	12	95
Net New Library Trips				32	12	45	109	119	228	1,803
Recreation Center (North)	495	8,000	S.F.	8	5	13	4	9	13	183
Internal from Residential (AM/PM) (8)	100%	100%		8	5	13	4	9	13	183
Net New Rec Center Trips				-	-	-	-	-	-	-
Recreation Center (South)	495	2,000	S.F.	2	1	3	1	2	3	46
Internal from Residential (AM/PM) (8)	100%	100%		2	1	3	1	2	3	46
Net New Rec Center Trips				-	-	-	-	-	-	-
Church	560	50,000	S.F.	19	17	36	17	16	33	456
Internal from Residential (AM/PM) (8)	5%	5%		1	1	2	1	1	2	23
Net New Church Trips				18	16	34	16	15	31	433
Day Care	565	12,000	S.F.	81	72	153	74	84	158	951
Internal from Residential (AM/PM) (8)	25%	25%		20	18	38	19	21	40	238
Internal from Office (AM/PM) (8)	25%	25%		20	18	38	19	21	40	238
Net New Day Care Trips				41	36	77	37	42	79	476
County Park	412	25	Acres	-	0	0	1	1	2	58
Internal from Residential (AM/PM) (8)	0%	0%		-	-	-	-	-	-	-
Net New Rec Center Trips				-	0	0	1	1	2	58
Total Approved Site Trip Generation				1,296	1,305	2,601	1,408	1,526	2,934	39,658

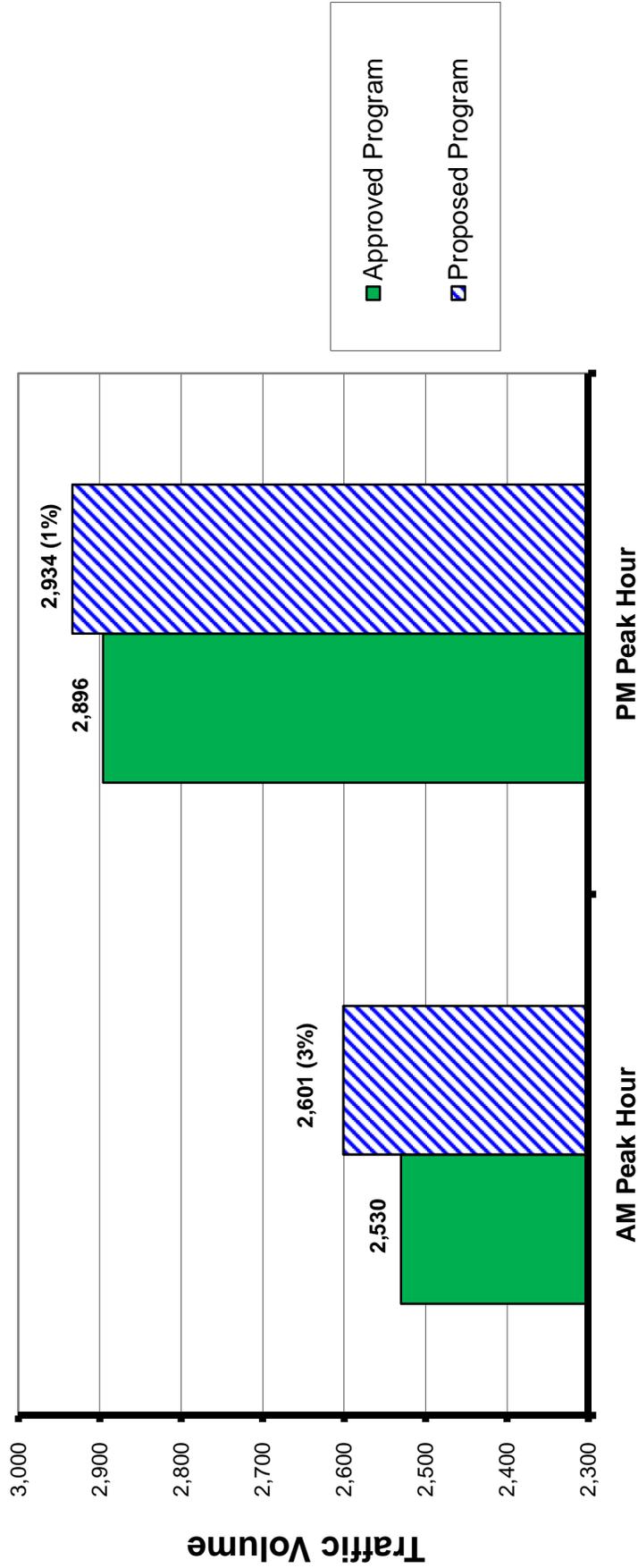
- Notes: (1) Trip generation based on Institute of Transportation Engineers Trip Generation, 7th Edition.
(2) Development densities based on site plans provided by Urban Engineering and include Land Bay 9.
(3) Average Daily Traffic for SFDU 10/D.U. and SFA of 8.7/D.U. based on County rate.
(4) Transportation Systems Management (TSM) reduction applied to peak hour, peak direction trips as assumed in original 1995 and August 2005 traffic studies.
(5) Pass-by rate utilized by VDOT and assumed in original 1995 and August 2005 traffic studies.
(6) Rate based on original June 1995 traffic study.
(7) Rate based on information provided by Loudoun County Public Schools.
(8) Rate based on information provided by Van Metre Companies.

Table 5
 Stone Ridge Commercial
 Trip Generation Comparison

Program	AM Peak Hour			PM Peak Hour			Average Daily Traffic
	In	Out	Total	In	Out	Total	
Approved Program	1,231	1,299	2,530	1,404	1,492	2,896	39,327
Proposed Program	<u>1,296</u>	<u>1,305</u>	<u>2,601</u>	<u>1,408</u>	<u>1,526</u>	<u>2,934</u>	<u>39,658</u>
Difference	66	6	71	4	34	38	331
Percentage	5%	0%	3%	0%	2%	1%	1%

Notes: (1) Trip generation based on Institute of Transportation Engineers Trip Generation, 7th Edition.

Stone Ridge Commercial Trip Generation Comparison



Trip Distribution Analysis

The distribution of external peak hour trips generated by Stone Ridge Commercial was determined based on previous traffic studies. Separate distributions were developed for the residential, employment, retail, and civic uses, consistent with previously approved studies. These distributions were used to apply the site-generated trips to the planned road network. The external and internal trip assignments between the various land bays within Stone Ridge were is contained in Appendices E and F.

Future Traffic Forecasts

Overview. Future forecasts for 2015 were developed to reflect the currently approved and proposed development programs for Stone Ridge. These volumes are based on a composite of existing volumes; traffic generated by the 19 other area developments and regional growth factors. The resultant traffic volume forecasts and daily traffic volume estimates are shown on Figures 8 and 9.

Future Levels of Service

Overview. Future peak hour levels of service with the approved and proposed development programs of Stone Ridge were estimated at the key intersections in the study area for 2015 buildout conditions. The calculations were based on the future lane usage and traffic controls shown on Figures 6 and 7 that include planned improvements and current and proposed proffers and the Highway Capacity Manual methodology, in accordance with the FSM guidelines. The results are summarized on Table 2 and presented in Appendices G and H.

The results indicate the following:

Approved Program

1. Assuming the improvements currently planned by others are installed, that include a new traffic signal and turn lanes, the U.S. Route 50/Goshen Road intersection would operate acceptable levels of service in 2015 during both the AM and PM peak hour.
2. The proposed driveway on U.S. Route 50 serving Land Bay 9 would require separate left and right turn lanes in accordance with the CTP and VDOT requirements. Assuming improvements planned by others, this intersection would operate at acceptable levels of service during both the AM and PM peak hours.
3. Based on the planned improvements, the U.S. Route 50/Stone Springs Boulevard intersection is projected to operate at overall acceptable levels of service (at LOS “D”)

during both the AM and PM peak hours, with some individual movements operating at LOS "E". This assumes the extension of Stone Springs Boulevard to the north and the modification of the northbound approach.

4. The right turning movements at the converted U.S. Route 50/Route 659 intersection to right-in/right-out only are forecasted to operate at acceptable levels of service during both the AM and PM peak hours.
5. The relocated signalized U.S. Route 50/West Spine Road intersection would operate at acceptable levels of service during the AM and PM peak hours.
6. The U.S. Route 50/Loudoun County Parkway (Route 606) intersection would operate beyond capacity during both peak periods.
7. The anticipated traffic signal at the Route 659 (West Spine Road)/Tall Cedars Parkway intersection would operate at acceptable levels of service during both the AM and PM peak hours.
8. All of the turning movements at the access to Land Bay 7 on Millstream Drive would operate at acceptable levels of service under stop sign control.
9. All of the turning movements at the South Point Drive access to the office and residential Land Bays FF1A and FF2B would operate at acceptable levels of service under stop sign control.
10. All of the turning movements at the Millstream Drive/Sandbar Terrace/Tall Cedars Parkway intersection would operate at acceptable levels of service under stop sign control.

Proposed Program

Future peak hour intersection levels of service with the proposed Stone Ridge Commercial development program were estimated at the key intersections in the study area based on the future lane usage and traffic control shown on Figure 7 and the Highway Capacity Manual methodology. The results are presented in Appendix J and summarized in Table 2.

The results for future conditions, with the Stone Ridge Commercial program, are consistent with those realized under approved conditions since the number of additional peak hour trips that would be added to the road network is minimal. The proposed development program would result in minor decreases in delay at some intersections, primarily due to the extension of South Point Drive (formerly Canary Grass Court). Other intersections would realize minimal increases in peak hour delay with the proposed program. It is noted that the fluctuations in delay at these signalized intersections are within approximately three (3.0) seconds that is not perceivable by motorists.

The internal intersections identified for future traffic signals under approved conditions would continue to apply with the Stone Ridge Commercial program. All of the minor intersections would operate adequately under stop sign control.

The proposed internal road network changes within Stone Ridge, including the extension of South Point Drive and Millstream Drive would better serve the planned employment uses, reduce commercial and heavy vehicle traffic along Tall Cedars Parkway, provide a future connection to the West Spine Road and allow residents of the community to access commercial uses without traveling on U.S. Route 50.

Stone Ridge has made a number of roadway improvements in order to accommodate the currently approved development program that includes new traffic signals, lane improvements, and Transportation Demand Management (TDM) measures to mitigate the impacts of the development and improve mobility in the Dulles South area. The additional transportation proffers associated with this change in development program would more than adequately offset the minimal increase in peak hour trips associated with the zoning change.

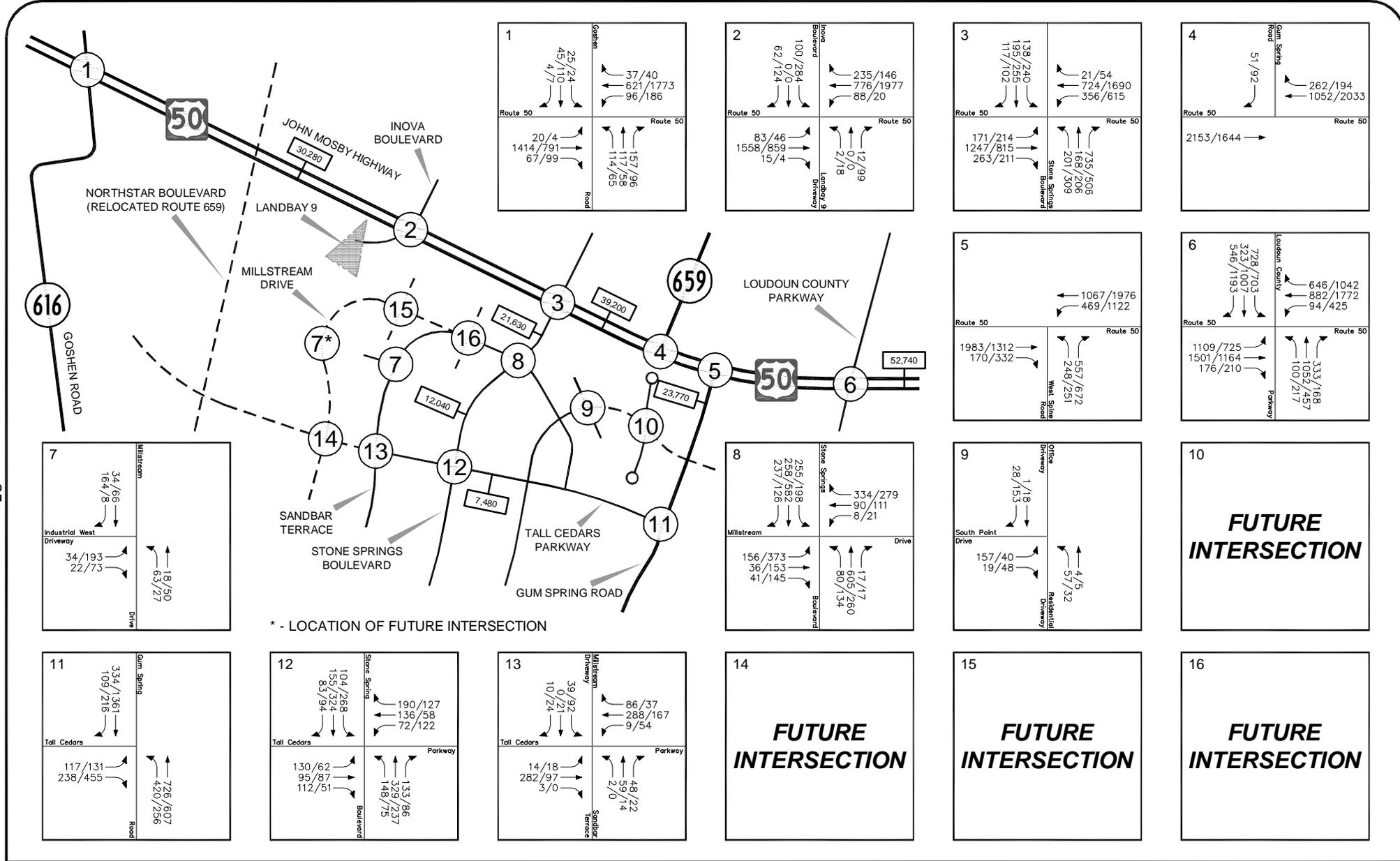


Figure 8
2015 Future Approved Traffic Forecasts

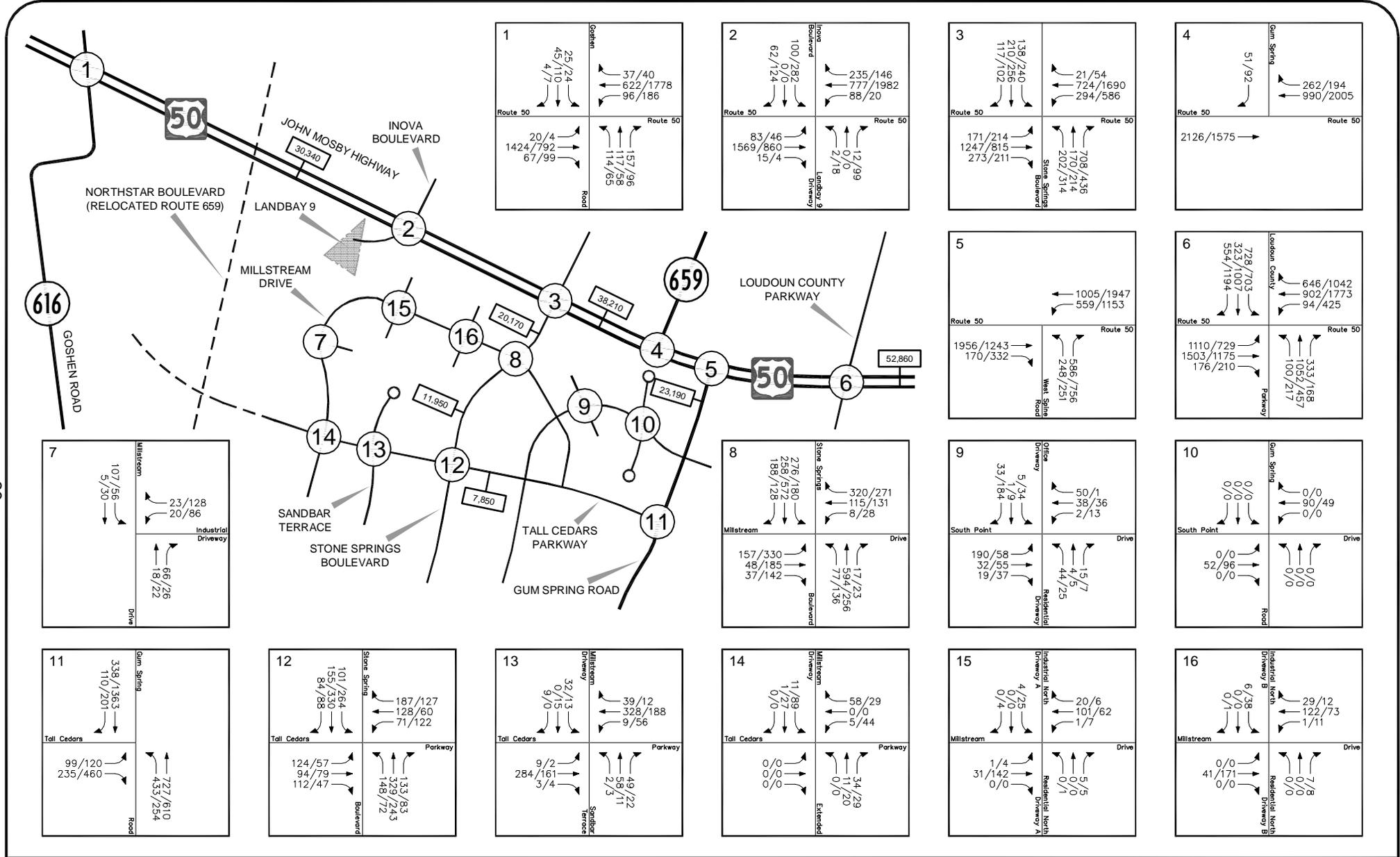


Figure 9
2015 Future Proposed Traffic Forecasts

ADT Average Daily Trips

AM PEAK HOUR
PM PEAK HOUR
000/000



2030 Loudoun County Model Analysis

As recently adopted by Loudoun County, a review of the traffic forecasts contained in the 2030 traffic volume model was prepared as part of the long-range analysis procedure to assess buildout plus 10-year conditions. The Viper model information was provided by OTS staff for the roadway links adjacent to Stone Ridge and reflect the 2030 average daily (24-hour) volume forecasts for these facilities. The model volumes reflect the Round 7.0 Land Use data and the currently adopted Countywide Transportation Plan (CTP). A summary of the volumes is shown on Figure 10.

The traffic model is being used on a macro basis to update and evaluate the current CTP and as a tool to assess development proposals under long-range conditions. The traffic model includes several planned roadway connections, and compares the volume forecasts to general roadway cross sections for capacity purposes. The modification and refinement of this model is on-going.

Conclusions

The purpose of this traffic study has been to identify the roadway impacts of the Stone Ridge Commercial project. The conclusions are summarized below.

1. Several of the signalized intersections on U.S. Route 50 at Stone Springs Boulevard, Route 659, and Route 606 currently operate near or at capacity during the AM and PM peak hours. The turning movements at unsignalized locations within Stone Ridge operate at acceptable levels of service.
2. Stone Ridge proposes to rezone and/or modify land parcels within the site that would result in a net nominal increase of 2,424 S.F. of commercial space. This would be achieved by increasing general office space by 115,508 S.F. and reducing light industrial space by 113,084 S.F. The total number of approved residential units (3,265 D.U.) would remain as currently approved.
3. The proposed development program changes for Stone Ridge Commercial would have minimal effect on peak hour trips. The proposed development program would generate 71 (or 3.0 percent) *more* trips during the AM peak hour, and 38 (or 1.0 percent) *more* trips during the PM peak hour. A total of 331 (or 1.0 percent) *more* trips would be generated on a 24-hour basis. In addition, the proposed program would have less impact on the peak hour, peak direction trips since the shift in development density is proposed to be employment uses. The majority of additional trips generated by the site would be added in the reverse direction of the peak commuter traffic flow, minimizing its impact to the road network.
4. The future capacity analyses indicate that the majority of major intersections on U.S. Route 50 would operate at acceptable levels of service with or without the development program changes proposed within Stone Ridge. The net increase in vehicle trips would have minimal impact to the overall levels of service and delays at regional intersections. Adequate levels of service would be provided at all of the intersections internal to the site under both approved and proposed buildout conditions.
5. The road network changes proposed in conjunction with the Stone Ridge Commercial development program include:
 - The extension of South Point Drive from Millstream Drive to existing Gum Spring Road (VA Route 659) and the future West Spine Road.
 - Intersection improvements to include a new traffic signal and turn lanes at the West Spine Road/U.S. Route 50 intersection through existing Stone Ridge proffers.
 - A new site driveway to Land Bay 9 from U.S. Route 50 opposite the planned access to the Inova property.

- Realignment of Millstream Drive west of Stone Springs Boulevard to access Land Bay 7 and connect to Tall Cedars Parkway west of the residential areas.
 - Construction of the two eastern lanes of North Star Boulevard (Relocated Route 659) within the Stone Ridge property from Tall Cedars Parkway to the south site boundary. Reservation of adequate right-of-way for the ultimate six-lane section.
6. The roadway network changes and transportation proffers associated with the Stone Ridge Commercial program would mitigate site traffic impacts and benefit residents of Stone Ridge and the public by:
- Providing enhanced access to the existing retail and planned employment uses.
 - Reducing the amount commercial and heavy vehicle traffic along Tall Cedars Parkway.
 - Allowing residents of the community to access commercial uses within Stone Ridge and adjacent development parcels without traveling on U.S. Route 50.
 - Providing alternative access to the West Spine Road.

Questions regarding this document should be directed to Wells + Associates.