



March 31, 2015

Mr. George Stock, PE
Stock & Associates, Inc.
257 Chesterfield Business Parkway
St. Louis, Missouri 63005

RE: Traffic Access Assessment
The Grove in Frontenac and Frontenac Square
Frontenac, Missouri
514-0045-0TE

Dear Mr. Stock:

Lochmueller Group has completed the following traffic assessment for the proposed “The Grove in Frontenac” and “Frontenac Square” developments located in Frontenac, Missouri. The development site includes the former Ladue Early Childhood School (currently vacant) and adjoining single-family residences. The site is generally located in the northeast quadrant of Clayton Road and Spoede Road. The Grove proposes a 108-bed senior living facility and the Square proposes 36 residential villas. A preliminary site plan is shown in **Exhibit 1**.

Access to the site would be provided via a new main driveway on Clayton Road and a new connection to the adjacent Frontenac City Hall site, which would enable shared usage of City Hall’s existing ‘west’ driveway onto Clayton Road. Access to the villas and the rear parking area for the Grove would be provided via the main driveway onto Clayton Road, whereas only the front parking area for the Grove would connect to the City Hall site. Hence, the shared-use and main driveways would not be connected internally through the site. The two existing site driveways would be removed.

The purpose of this assessment was to forecast the amount of traffic that would be generated by the proposed development, assess the relative impact of the site-generated traffic upon Clayton Road, and identify appropriate access configurations for the site.

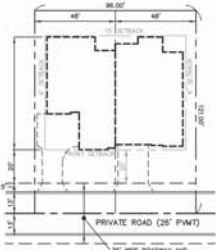
Existing Roadway and Traffic Conditions

Clayton Road is a minor arterial maintained by the City of Frontenac. It has a posted speed limit of 35 miles per hour (mph). Adjacent to the site, Clayton Road has two westbound lanes, one eastbound lane, and a dedicated eastbound left-turn lane into the existing entrance to the vacant Ladue Early Childhood School.

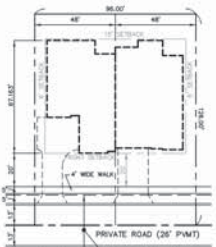
FRONTENAC SQUARE AND THE GROVE IN FRONTENAC

A TRACT OF LAND BEING
LOCATED IN U.S. SURVEY 2675, TOWNSHIP 45 NORTH, RANGE 5 EAST OF THE 5TH PRINCIPAL MERIDIAN
CITY OF FRONTENAC, ST. LOUIS COUNTY, MISSOURI

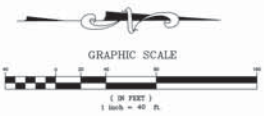
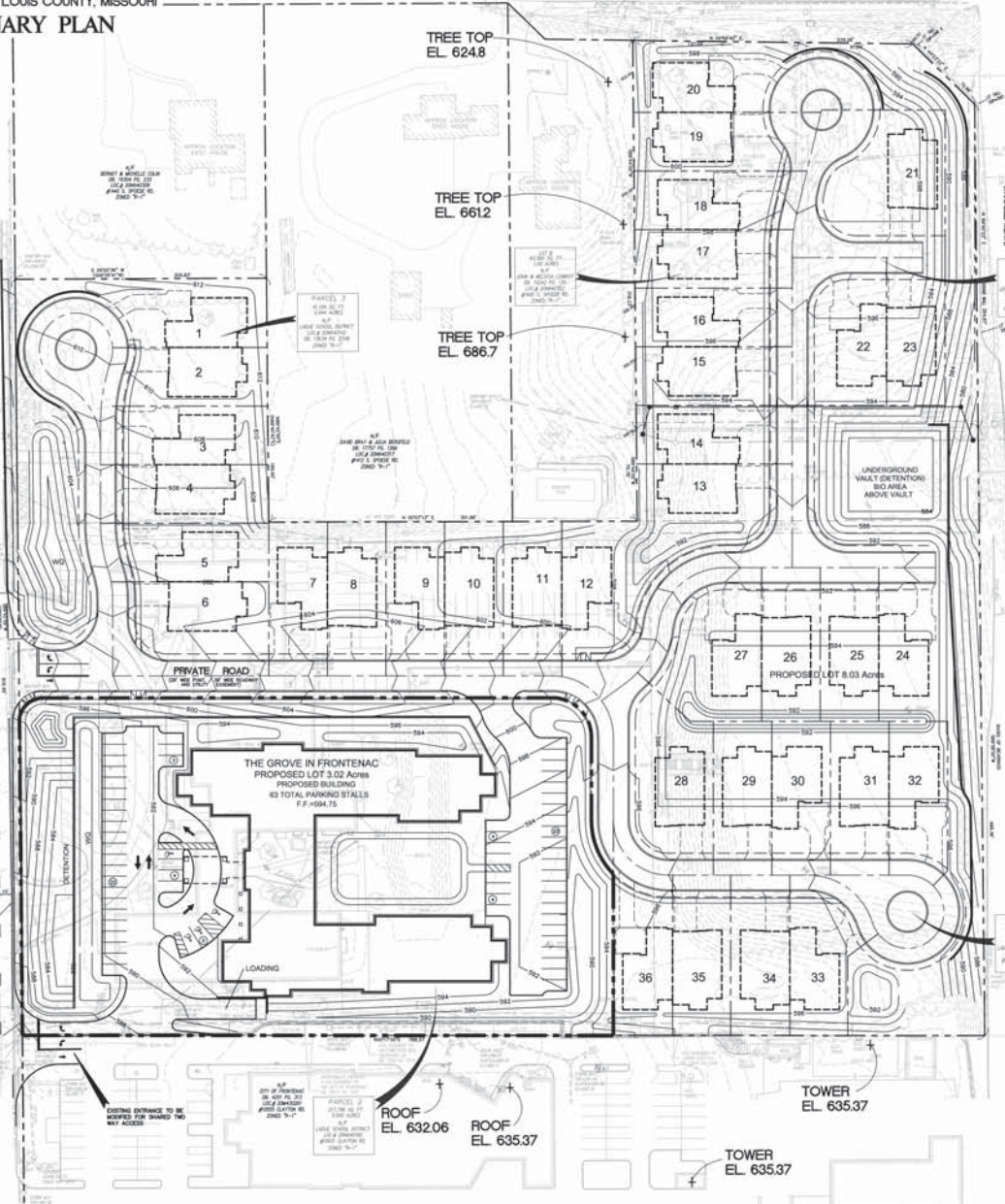
PRELIMINARY PLAN



TYPICAL ATTACHED VILLA LOT LAYOUT (WITHOUT SIDEWALK)



TYPICAL ATTACHED VILLA LOT LAYOUT (WITH SIDEWALK)



TOTAL TRACT DESCRIPTION

A TRACT OF LAND BEING LOCATED IN U.S. SURVEY 2675, TOWNSHIP 45 NORTH, RANGE 5 EAST, IN THE CITY OF FRONTENAC, ST. LOUIS COUNTY, MISSOURI BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF A TRACT OF LAND AS CONVEYED TO THE CITY OF FRONTENAC BY INSTRUMENT RECORDED IN BOOK 4320, PAGE 313 OF THE ST. LOUIS COUNTY RECORDS FROM WHICH A FOUND CUT CROSS BEARS SOUTH 03 DEGREES 21 MINUTES 24 SECONDS EAST, 2.36 FEET, SAID POINT ALSO BEING LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF CLAYTON ROAD, VARIABLE WIDTH, THENCE ALONG SAID RIGHT-OF-WAY LINE SOUTH 89 DEGREES 42 MINUTES 58 SECONDS WEST (SOUTH 89 DEGREES 38 MINUTES WEST), 619.45 FEET TO THE SOUTHWEST CORNER OF A TRACT OF LAND AS CONVEYED TO COLIN W AND MICHELLE A BENNETT BY INSTRUMENT RECORDED IN BOOK 4320, PAGE 333 OF THE ABOVE SAID RECORDS, FROM WHICH A FOUND CONCRETE MONUMENT BEARS SOUTH 8 DEGREES 02 MINUTES 00 SECONDS WEST, 0.88 FEET, THENCE ALONG THE EAST LINE OF SAID BENNETT TRACT, NORTH 00 DEGREES 00 MINUTES 36 SECONDS EAST (NORTH 00 DEGREES 30 MINUTES 41 SECONDS EAST), 205.81 FEET TO THE NORTHEAST CORNER OF SAID BENNETT TRACT, SAID POINT ALSO BEING LOCATED ON SOUTH LINE OF A TRACT OF LAND AS CONVEYED TO DAVID G BRAY AND ALIA DRUM BERGFELD BY INSTRUMENT RECORDED IN BOOK 17757, PAGE 1286 OF ABOVE SAID RECORDS, FROM WHICH A FOUND IRON PIPE BEARS SOUTH 91 DEGREES 38 MINUTES 00 SECONDS WEST, 0.25 FEET, THENCE ALONG SAID SOUTH LINE, NORTH 89 DEGREES 42 MINUTES 58 SECONDS EAST (NORTH 89 DEGREES 42 SECONDS EAST), 749.90 FEET TO THE EAST LINE OF A TRACT OF LAND AS CONVEYED TO THOMAS AND SHARR COLLETON, BY INSTRUMENT RECORDED IN BOOK 7906, PAGE 251 OF ABOVE SAID RECORDS, NORTH 00 DEGREES 00 MINUTES 13 SECONDS EAST (NORTH 00 DEGREES 07 MINUTES EAST), 501.86 FEET TO A FOUND IRON PIPE AT NORTHEAST CORNER OF SAID COLLETON TRACT, THENCE ALONG THE NORTH LINE OF SAID COLLETON TRACT, SOUTH 89 DEGREES 44 MINUTES 00 SECONDS WEST, 563.99 FEET TO THE EAST RIGHT-OF-WAY LINE OF SOUTH SPODE ROAD, VARIABLE WIDTH, THENCE ALONG SAID RIGHT-OF-WAY LINE NORTH 00 DEGREES 39 MINUTES 42 SECONDS EAST, 239.28 FEET AND NORTH 44 DEGREES 23 MINUTES 22 SECONDS EAST, 70.86 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF INTERSTATE ROUTE 40, VARIABLE WIDTH, THENCE ALONG SAID RIGHT-OF-WAY LINE, NORTH 89 DEGREES 40 MINUTES 22 SECONDS EAST, 264.87 FEET AND NORTH 89 DEGREES 38 MINUTES 00 SECONDS EAST, 488.36 FEET TO A FOUND CONCRETE MONUMENT LOCATED ON THE WEST LINE OF ABOVE SAID CITY OF FRONTENAC TRACT, THENCE ALONG SAID WEST LINE, SOUTH 00 DEGREES 12 MINUTES 00 SECONDS WEST (SOUTH 0 DEGREES 15 MINUTES WEST), 788.37 FEET TO THE POINT OF BEGINNING AND CONTAINING 461.30 SQUARE FEET OR 10.549 ACRES.

- NOTES:**
- BOUNDARY AND TOPOGRAPHIC SURVEY BY STOOK AND ASSOCIATES CONSULTING ENGINEERS, INC.
 - SUBJECT PROPERTY LIES WITHIN FLOOD ZONE "X" (AREA DETERMINED TO BE OUTSIDE THE 100-YEAR FLOOD), ACCORDING TO THE NATIONAL FLOOD INSURANCE RATE MAP NUMBER 2918R0208J WITH A MAP REVISION DATE OF AUGUST 23, 2000.
 - GRADING AND STORM WATER PER CITY OF FRONTENAC, M.S.D., MOODY AND ST. LOUIS COUNTY STANDARDS AND SPECIFICATIONS. STORM WATER TO DISCHARGE AT AN ADEQUATE NATURAL DISCHARGE POINT. SPARKHOLES ARE NOT ADEQUATE NATURAL DISCHARGE POINTS.
 - NO SLOPE GREATER THAN 3:1 ALLOWED WITHOUT CITY AND GEOTECH. APPROVAL. GRADING SHALL FOLLOW GEOTECHNICAL RECOMMENDATIONS.
 - ALL UTILITIES SHOWN HAVE BEEN LOCATED BY THE ENGINEER FROM AVAILABLE RECORDS. THEIR LOCATION SHOULD BE CONSIDERED APPROXIMATE. THE CONTRACTOR HAS THE RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION, TO HAVE EXISTING UTILITIES FIELD LOCATED.
 - ALL UTILITIES WILL BE INSTALLED UNDERGROUND.
 - THE APPLICANT SHALL SUBMIT IMPROVEMENT PLANS FOR REVIEW BY THE CITY OF FRONTENAC.
 - PLAN SUBJECT TO CHANGE DURING AGENCY REVIEW & APPROVALS. THIS PLAN IS NOT FOR CONSTRUCTION.
 - ALL GREEN AREA, EXCEPT WOODED AREAS, INCLUDING PARKING LOT LANDSCAPING FOR COMMERCIAL USES, VILLAS AND TOWNHOMES SHALL BE IRRIGATED.
 - TRASH CHUTE/REAR IN SERVICE ARE OF SENIOR LIVING. INDIVIDUAL UNIT TRASH INDOOR FOR THE VILLAS AND TOWNHOMES.

PERTINENT DATA

LOCATOR NUMBER	201640142, 201640182, 201640261, 201640362, 191320280
OVERALL AREA	11.8649 Acres
EXISTING ZONING	R-1, ONE ACRE RESIDENCE
PROPOSED ZONING	"PD" DISTRICT
SEWER DISTRICT	MDC
TELEPHONE SERVICE	ATA&T
GAS SERVICE	LAKELAND GAS COMPANY
WATER SERVICE	MISSOURI AMERICAN WATER CO.
ELECTRIC SERVICE	AMEREN
FIRE DISTRICT	CITY OF FRONTENAC
SCHOOL DISTRICT	LADUE SCHOOL DISTRICT
F.I.R.M. No.	2918R0208J
PROPOSED USE	VILLAS AND TOWNHOMES SENIOR LIVING

ST. LOUIS COUNTY BENCHMARK

BENCHMARK # 13-24
ELEV=575 ft
"STANDARD ALUMINUM DISK" STAMPED SL-43 1992 DISK IS SET ALONG THE NORTH SIDE OF CLAYTON ROAD IN FRONT OF 22 CHATEAU WOOD DRUMMOND BL. 0.075 MI. WEST OF THE EAST ENTRANCE APPROXIMATELY 0.3 MILES WEST OF UNDERSTRAZZLEWAY.

PREPARED FOR:
PULTE HOMES OF ST. LOUIS, LLC
 17107 CHESTERFIELD AIRPORT ROAD
 SUITE 120
 CHESTERFIELD, MO 63005

THE GROVE ASSISTED LIVING, LLC
 16650 CHESTERFIELD GROVE RD.
 SUITE 100
 CHESTERFIELD, MO 63005

Exhibit 1: Site Plan (By Others)

PREPARED BY:



PRELIMINARY PLAN FOR:

FRONTENAC SQUARE THE GROVE IN FRONTENAC FRONTENAC, MO.



GEORGE M. STOOK E-25118
 CIVIL ENGINEER
 CERTIFICATE OF AUTHORITY NUMBER: 000996

REVISIONS:

NO.	DATE	DESCRIPTION
01	5/5/2014	3/20/15 REVISION PLAN
02	3/23/15	REVISION THE GROVE

DATE	TPS	GIS
5/5/2014	5/5/2014	5/5/15/2015
DATE	BY	BY
5/5/14	TPS	TPS
DATE	BY	BY
5/5/14	TPS	TPS
DATE	BY	BY
5/5/14	TPS	TPS
DATE	BY	BY
5/5/14	TPS	TPS
DATE	BY	BY
5/5/14	TPS	TPS

SHEET NO. 1
PRELIMINARY SITE PLAN
 SDP-11



UTILITY NOTE:
 ALL STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEY RECORDS AND INFORMATION AND THEREFORE DO NOT NECESSARILY REFLECT THE ACTUAL LOCATION OF ALL UNDERGROUND PIPES, STRUCTURES, AND UTILITIES. ENGINEER SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING OR CONSTRUCTION IMPROVEMENTS. THESE PREVISIONS ARE IN NO WAY ABSOLUTE. ANY PARTS FROM OTHER PLANS WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 216, RSMO.

To quantify existing traffic volumes, machine traffic counts were conducted on Clayton Road adjoining the site on Thursday May 15, 2014. From the counts, weekday traffic volumes averaged 14,790 vehicles per day. The morning and afternoon peak hours of traffic occurred from 7:15 to 8:15 a.m. and from 4:45 to 5:45 p.m. as shown in **Chart 1**. Two-way traffic volumes amounted to approximately 1,070 vehicles during the morning peak hour and 1,450 during the afternoon peak hours.

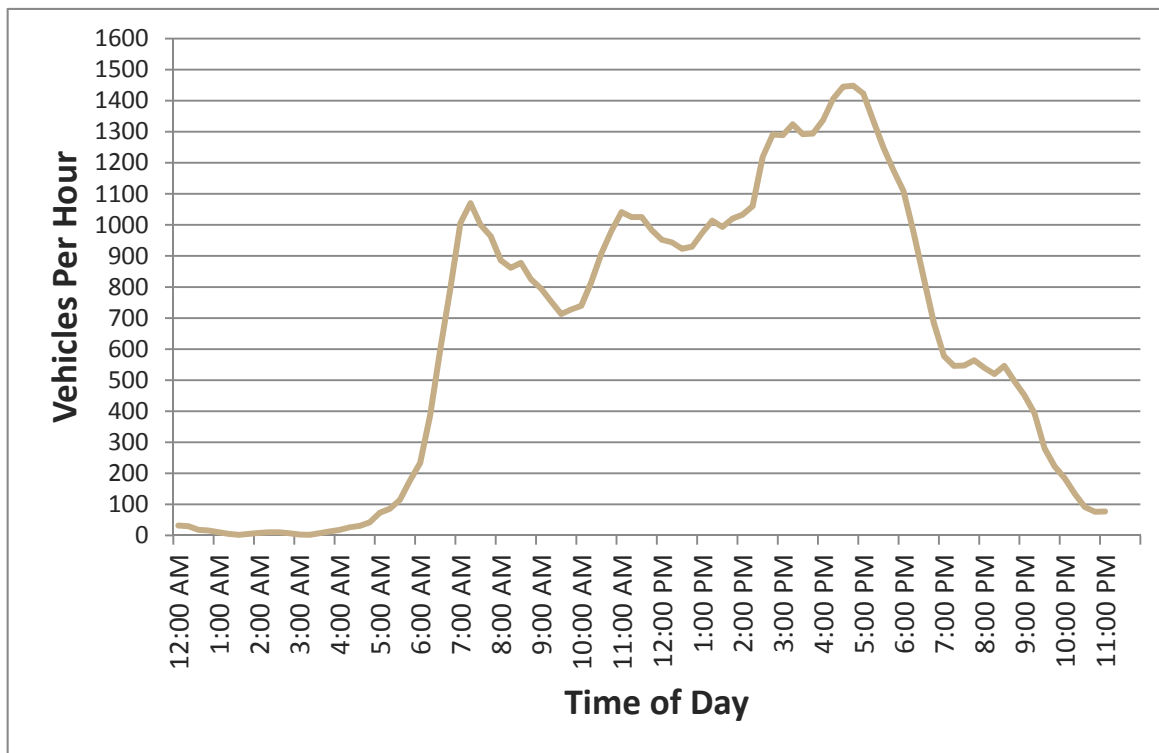


Chart 1: Weekday Traffic Volumes On Clayton Road

Trip Generation and Directional Distribution

The Grove would consist of a 108-bed senior living facility and the Square would include 36 residential villas. The number of trips that would be generated by the developments was forecasted based on information provided in the “Trip Generation Manual”, Ninth Edition, published by the Institute of Transportation Engineers (ITE).

This manual is a standard resource for transportation engineers and includes a compilation of nationwide studies documenting the trip generating characteristics of various land uses. Data for Assisted Living (ITE Land Use Code 254) was applied to the senior living facility and Residential Condominium/Townhouse (ITE Land Use Code 230) was applied to the Square. The resulting traffic projections for the proposed development is summarized in **Table 1**.



Table 1: Trip Generation Forecast

Use	Size	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Assisted Living	108 beds	13	7	20	15	16	31
Residential Villas	36 residences	2	14	16	13	6	19
Total		15	21	36	28	22	50

As summarized in **Table 3**, the proposed development would generate approximately 36 and 50 total trips during the morning and afternoon peak hours, respectively. This would amount to less than 1 trip per minute entering/exiting the site during the peak hours. Given this forecast, it stands to reason that the proposed development would almost certainly generate less traffic than the site’s previous use – the Ladue Early Childhood School.

In total, the proposed development would increase peak hour traffic on Clayton Road by approximately 3 percent. Given that traffic volumes on a roadway can fluctuate as much as 5 to 10 percent on a daily basis, this increase would represent a nominal change in conditions on Clayton Road and would not noticeably impact traffic operations.

Proposed Access and Recommended Improvements

Access to the site is proposed via a new main driveway on Clayton Road and a new connection to the adjacent Frontenac City Hall site, which would enable shared usage of City Hall’s existing ‘west’ driveway onto Clayton Road. The new driveway on Clayton Road would handle almost all of the site’s traffic, as it would provide exclusive access to the residential villas and the rear parking area for The Grove.

Conversely, the cross access connection to Frontenac City Hall would only serve the front parking area of The Grove, which would primarily be used by visitors. Staff and residents would use the rear parking area, accessed via the site’s main driveway. As a result, the anticipated increase in traffic using the ‘west’ driveway to City Hall as a result of the cross access connection would be minimal.

The site’s main driveway on Clayton Road should provide separate left-turn and right-turn lanes exiting the site and one lane entering the site. Clayton Road at the main driveway should continue to have two eastbound lanes and one westbound lane for through traffic. In addition, a center two-way left-turn lane should be implemented to help facilitate left-turns into and out of the site. This lane could be accommodated with minimal or no pavement widening by removing the former eastbound left-turn lane into the Ladue Early Childhood School. In fact, the recommended cross-section on Clayton Road at the site’s main driveway would mirror the section on Clayton Road in front of Frontenac City Hall.

In order to accommodate shared usage, the Frontenac City Hall 'west' driveway would be converted from one-way entering to two-way traffic. Consequently, the driveway should be widened to provide at least one entering lane and one exiting lane. The existing cross-section on Clayton Road already provides a center left-turn lane at that location, so no modifications would be needed.

Conclusion

Lochmueller Group has completed the preceding traffic assessment for the proposed "The Grove in Frontenac" and "Frontenac Square" developments. The development site includes the former Ladue Early Childhood School (currently vacant) and adjoining single-family residences and is generally located in the northeast quadrant of Clayton Road and Spoede Road. The Grove proposes a 108-bed senior living facility and the Square proposes 36 residential villas.

The proposed development would generate approximately 36 and 50 total trips during the morning and afternoon peak hours, respectively. In total, the proposed development would increase peak hour traffic on Clayton Road by approximately 3 percent. This increase would represent a nominal change in conditions on Clayton Road and would not noticeably impact traffic operations.

The site's main driveway on Clayton Road should provide separate left-turn and right-turn lanes exiting the site and one lane entering the site. A center two-way left-turn lane should also be provided on Clayton Road at the site's main driveway to help facilitate left-turns into and out of the site. Frontenac City Hall's 'west' driveway would be converted from one-way entering to two-way traffic to accommodate cross access traffic to/from the proposed development.

It can be concluded that the proposed development would have a nominal impact upon traffic on Clayton Road and the proposed site access configuration would effectively serve entering and exiting traffic volumes. We trust that you will find this report useful in evaluating the traffic impacts associated with "The Grove in Frontenac" and "Frontenac Square". Please do not hesitate to contact me at (314) 621-3395 if you have any questions or comments regarding this information.

Sincerely,
Lochmueller Group, Inc.

A handwritten signature in black ink that reads "Christopher W. Beard".

Christopher W. Beard, PE, PTOE
Manager of Transportation Planning, Associate