Appendix A- Example of Study Format

The content and scope of Traffic Impact Analysis (TIA) reports will vary with the needs of each project. As determined in the scope of the TIA, the following information should be included in the report:

1. Cover sheet including name and location of the project, developer name and address, preparer signature, and date
2. Table of Contents, including a list of Figures and Tables
3. Executive Summary: a brief stand-alone summary of the study findings, including a description of the project, study scope, and recommended project improvements. The executive summary includes "Impact Summary Tables" and a "Mitigation Map Figure," as provided in Appendix D & E.
4. Introduction, purpose, and scope
5. Description of the proposed development including:
   - ☑ Location map showing study area land use and streets
   - ☑ Site plan showing internal circulation, parking, driveways, access locations
   - ☑ Proposed uses with existing and proposed zoning requirements
   - ☑ Phasing plan including proposed dates of project phase completion
6. Setting: Describe the existing roadway system within and around the project area; describe the programmed roadway improvements; describe location and routes of nearby public transit service; describe location and routes of the nearest bicycle and pedestrian facilities serving the project. Provide maps.
7. References to other related traffic impact studies
8. Clearly stated assumptions and thresholds of significance
9. Analysis of Existing Conditions:
   - ☑ Land use / Zoning, study intersections, and roadway segments
   - ☑ Lane geometry, daily volumes and peak hour turning movements
   - ☑ Level of Service (LOS)
   - ☑ Signal warrants; signal phasing and coordination
   - ☑ Queue analysis

- ☑ Collision history and collision rate analysis
- ☑ On-Street Parking
- ☑ Pedestrian & Bicycle Facilities and counts, and Transit Services

10. Trip Generation and Distribution
11. Analysis of Project Only Conditions:
    - ☑ Project access, on-site circulation, and parking
    - ☑ Trip Generation table showing rates and clearly showing any trip discounts
    - ☑ Trip distribution percentages figure
    - ☑ Project trip assignment figure showing project-only trips at all study intersections, roadway segments, and project driveways.
12. Analysis of Existing + Project Conditions:
    - ☑ Daily volumes and peak hour turning movements
    - ☑ Level of Service (with and without recommended project improvements)
    - ☑ Signal warrants
    - ☑ Queue analysis (with and without recommended project improvements)
    - ☑ Qualitative Traffic Safety
13. Traffic forecast
14. Analysis of Cumulative Conditions without the project:
    - ☑ Daily volumes and peak hour turning movements
    - ☑ Level of Service
    - ☑ Signal warrants
    - ☑ Queue analysis
15. Analysis of Cumulative Conditions with the project:
    - ☑ Daily volumes and peak hour turning movements
    - ☑ Level of Service (with and without recommended project improvements)
    - ☑ Signal warrants

- ☑ Queue analysis (with and without recommended project improvements)
- ☑ Qualitative Traffic Safety

16. Transit, bicycle, and pedestrian Analysis
17. Traffic Impacts and Recommended Project Improvements:
    - ☑ Summary table of daily and peak hour LOS, with and without project improvements
    - ☑ Findings for short term and cumulative impacts and special analysis
    - ☑ Responsibility for mitigation of short term and cumulative impacts
    - ☑ Mitigation measure phasing plan
    - ☑ The project's mobility impact and fee
    - ☑ Cost estimates for mitigation and financing plan
    - ☑ Map or aerial photo identifying proposed improvements
18. Technical Appendices:
    - ☑ Detailed worksheets for all LOS analysis (including project improvements), Signal Warrants, Queuing analysis calculations, and Fair share calculations
    - ☑ Raw traffic count data
    - ☑ Crash data
    - ☑ Other back-up data
    - ☑ Travel Demand output and network
19. Final TIA report and all appendices provided in electronic format, including both PDF and native file formats, as specified in the scope.

Scope for Traffic Impact Analysis

Date: _____Application No.:_____ Project Name: _____ Project Description: _____ _____ Developer: _____ _____

Traffic Consultant: _____

Traffic Impact Analysis for the above listed project shall encompass this scope, in accordance with the County's Traffic Impact Analysis Guidelines.

1 General Information and Assumptions

A. Study Area Limits and map:_____

_____

_____

B. Scenarios to be studied (check if applicable):

- ☑ Existing (Year:_____)
- ☑ Project Only
- ☑ Existing + Proposed Project

Either:

- ☑ Cumulative (Existing + Approved/Pending Project List)
- ☑ Cumulative (Existing + Approved/Pending Project List + Proposed Project)

Or:

- ☑ Cumulative (County Travel Demand Model without Project)

- ☑ Cumulative (Travel Demand Model + Proposed Project)
  - ☑ Assumed Cumulative Model Year: __

C. Approved and Pending Projects List:

D. Analysis Periods (check if applicable):

- ☑ Weekday AM peak hour
- ☑ Weekday PM peak hour
- ☑ Weekday Mid-day peak hour
- ☑ Saturday mid-day peak
- ☑ Sunday mid-day peak hour
- ☑ Other: _____

E. Comprehensive Plan Amendment (check if applicable):

Provide analysis based on the existing land use, assuming average intensity, in addition to analysis based on the proposed new land use with the project.

F. Programmed Transportation Improvements

G. Forecast Approval: Project trip generation, reductions, distribution, and any traffic model changes shall be submitted for pre-approval prior to submitting the draft traffic report, consistent with sections 4.2 and 4.3 of the Traffic Impact Analysis Guidelines.

H. Assumed Year of Project Completion:_____

I. Assumed Project Phasing (units/phase and years):

J. Technical Assumptions: The technical parameters shown [insert reference or copy] of the Traffic Impact Analysis Guidelines shall be assumed in the analysis unless specified otherwise:

2 Study Data Requirements

A. Data Collection (check if applicable):

- ☑ Peak hour turning movements at study intersections
- ☑ Directional daily traffic on study roadway segments

Truck Counts- location(s):_____ Pedestrian counts- location(s):_____ Speed Survey- location(s): _____

( ) Radar ( ) Tube ( ) Camera

- ☑ Floating car runs- arterial segment(s):_____
- ☑ License plate survey for cut-through traffic location(s): _____

- ☑ Determine actual grade(s) location(s):_____

- Other Data Collection: _____

_____

B. Recent/Available Traffic Studies and Data: _____

_____

_____

3 Intersection Analysis

Study Intersections:

Q- Designates locations, where Queuing and turn lane storage analysis, is required.

T- Designates locations where Truck counts are required in addition to total counts.

4 Roadway Segments

Study Roadway Segments:

1) from: _____ to: _____

2) from: _____ to: _____

3) from: _____ to: _____

4) from: _____ to: _____

5 Project Analysis Elements

A. Project Driveways, Access, and on-site circulation (check if applicable):

For All Projects:

- ☑ Project Only Trips
- ☑ LOS analysis of each recommended project mitigation
- ☑ Impact analysis for each development phase of the project

For Projects with Driveway Access:

- ☑ Minimum sight distance requirements at project driveways
- ☑ Project Access Queue and LOS, including:
  - ☑ Minimum required throat depth at project driveways
  - ☑ 95th percentile queue lengths at driveways and turn lane spill-over
  - ☑ Conformance to County policy/code/regulations entrances and setbacks
  - ☑ Review for shared driveways and access management (right-in / right-out, etc.)

- ☑ Impacts on other driveways and intersections
- ☑ On-site parking and circulation
- ☑ Signal warrant analysis (MUTCD) for any new signal proposed at a project access
- ☑ Evaluate the adequacy of on-site parking and identify impacts to off-site parking
- ☑ Evaluate on-site circulation, including truck loading and turning radii Design Vehicle
- ☑ Queuing analysis of on-site drive-thru facilities

B. Traffic Analysis (circle if applicable):

- ☑ Intersection Level of Service (LOS)
- ☑ Closely spaced intersection analysis

☑ Queue analysis)

- ☑ Signal warrants (MUTCD)
- ☑ Roadway segment analysis:
- ☑ Peak Hour Volume method, or
- ☑ HCM method
- ☑ Identify Local Residential Streets internal or adjacent to the project estimated to exceed acceptable traffic levels and make
- ☑ Recommendations
- ☑ Coordinated corridor analysis
- ☑ Average and 85th percentile speeds
- ☑ Drive-thru queuing analysis
- ☑ Collision history and rate analysis
- ☑ On-Street Parking
- ☑ Road LOS:_____
- ☑ Cumulative fair share calculation
- ☑ Traffic calming recommendations
- ☑ Cost estimates for mitigation
- ☑ The financing plan for improvements
- ☑ Weaving section LOS location(s):_____
  - ☑ Ramp merge and diverge LOS:
  - ☑ Ramp Meter Analysis:_____

6 Other Analysis Elements

A. Other Analysis (circle if applicable):

- ☑ Transit Services within ¼ mile and pedestrian access routes
- ☑ Preliminary design to demonstrate feasibility of proposed mitigation(s)
- ☑ Existing and planned Pedestrian & Bicycle Facilities: Bike Plan consistency, onsite circulation, trip generation, and potential impacts
- ☑ Qualitative evaluation of traffic safety related to the addition of project traffic
- ☑ Recommendations for Safe Routes to School
- ☑ Other Analysis:

7 Submittal Requirements

A. Draft TIA document:

- ☑ Number of bound copies _____
- ☑ Copies of Study Appendix, including calculation worksheets
- ☑ Travel Demand model files

B. Final TIA document (check if applicable):

- o Number of bound copies _____
- o Electronic report and Appendices, including PDF and native file formats:
  - CD, or
  - Preparer's FTP site, or
  - Email to: _____

- Other: _____

Persons and Agencies present during project scoping:

SIGNED: _____ Date: _____

Applicant or Consultant

SIGNED: _____ Date: _____

County Representative

Appendix C Traffic Model Changes

The regional travel demand model is an activity-based model and is not a conventional travel demand forecasting model similar in structure to most current area-wide models used for traffic forecasting. The model uses land use, socioeconomic, and road network data to estimate travel patterns, roadway traffic volumes, and transit volumes at a parcel level.

Traffic Impact Studies which make use of the adopted travel demand model and shall provide documentation of the use and modifications to the model files, similar to the following:

1. **Model Files Provided:** The model runs used in this study are based on "Version month year" of the Travel Demand Model as provided by the adopting authority.

2. **Model Revisions:** The model files were revised to create these new scenarios:

   - ☑ Existing + approve/pending projects + project
   - ☑ Cumulative 2040 + project

Modifications to the model files affected only the project area. No modifications were made outside of the immediate project area.

3. **Road Network Revisions:** The travel model uses coded representations of the region's existing and future roadway networks. A "master network" was developed for the LRTP update of the model. The master network contains information on the years that various road improvement projects are programmed for implementation. The master network can be used to generate the model road network for any study year.

Changes to the Master Network:

Changes to a specific Scenario Network:

4. **Traffic Analysis Zone (TAZ) and Parcel Revisions:** The Traffic Analysis Zones (TAZ assigned to the project area were reallocated to best represent the proposed site layouts

5. **Land Use Revisions:** Land use assumptions are contained in the land use database stored a database in GIS format. The workbook produces the trip generation inputs to the model. The land use inputs for TAZs within the project area were modified to represent the land uses that are proposed as part of the proposed project.

The following changes were made to the Land Use Database

6. **Other Revisions:**

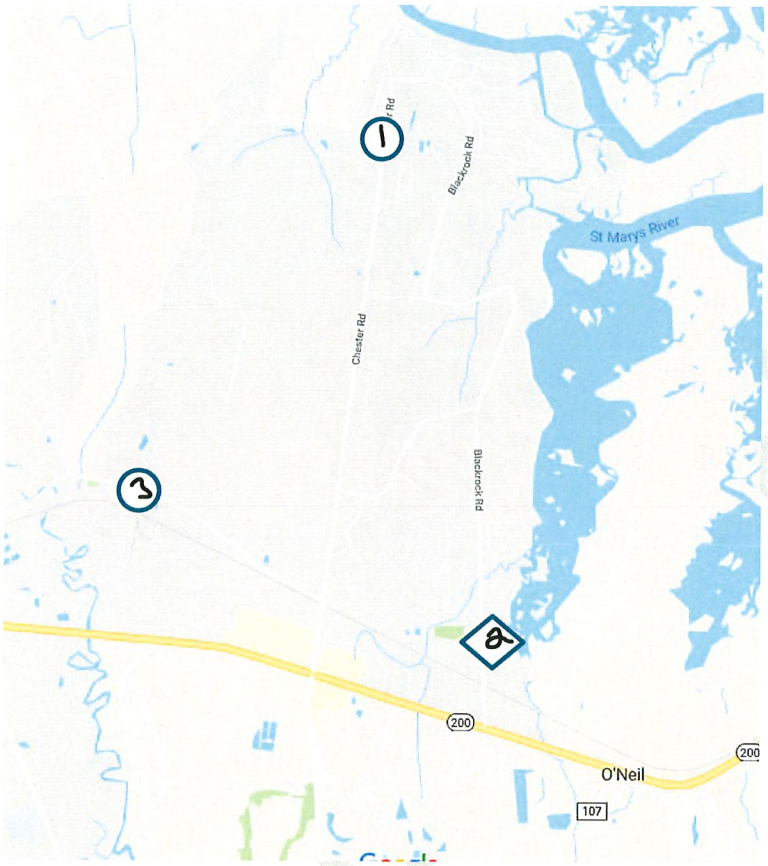
Reallocation of Local Intersection Volumes. The traffic model often aggregates multiple individual lands uses into larger traffic analysis zones that are represented as single points. As a result, all traffic to and from each land use within a zone is assumed to use the identical routes when the reality is that traffic will follow more specific local access routes to logically arrive at a specific destination within the zone. The following manual reassignments were made to correct for aggregation of trips within a TAZ:

Roadway Impact Summary Example

		1		2		3		4	
		Road		**Segment**		**Segment**		**Segment**	
Target LOS		C		C		C		C	
Arterial Class		II		III		II		II	
Posted Speed Limit		40		35		45		45	
Direction	Peak Hr.	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	Northbound	Southbound
Roadway Operations		Speed LOS	Speed LOS	Speed LOS	Speed LOS	Speed LOS	Speed LOS	Speed LOS	Speed LOS
Existing	AM	37.6 A	37.1 A	37.6 A	37.1 A	37.6 A	37.1 A	37.6 A	37.1 A
	PM	37.5 A	37.1 A	37.5 A	37.1 A	37.5 A	37.1 A	37.5 A	37.1 A
Existing Plus Project	AM	34.7 B	34.3 B	34.7 A	34.3 A	34.7 B	34.3 B	34.7 B	34.3 B
	PM	37.5 A	37.2 A	37.5 A	37.2 A	37.5 A	37.2 A	37.5 A	37.2 A
Cumulative without Project	AM	31.4 B	31.1 B	31.4 A	31.1 A	21.0 D	31.1 B	31.4 B	31.1 B
	PM	34.6 B	34.2 B	34.6 A	34.2 A	20.7 D	34.2 B	34.6 B	34.2 B
Cumulative Plus Project	AM	23.4 C	23.1 C	23.4 C	23.1 C	18.0 D	23.1 C	23.4 C	23.1 C
	PM	33.4 B	33.1 B	27.9 B	28.7 B	18.3 D	33.1 B	33.4 B	33.1 B

Appendix E- Example Mitigation Map Figure

Example Mitigation Map



Legend:

Existing Plus Project Mitigation

Cumulative Project Mitigation

Appendix F Preliminary Review Form

Date: _____

Application No.:_____

Project Name: _____

Project Description: _____

Developer: _____

Traffic Consultant: _____

The draft Traffic Impact Analysis report for the above listed project shall be prepared in consistent with the study scope, in accordance with the County's Traffic Impact Analysis Guidelines.

Preliminary Review Checklist:

	Consistency with Scope and Guidelines	
1. Executive Summary	( ) OK	( ) Needs Revision*
2. Executive Summary Tables	( ) OK	( ) Needs Revision*
3. Project Site Plan	( ) OK	( ) Needs Revision*
4. Scenarios	( ) OK	( ) Needs Revision*
5. Approved / Pending Project List	( ) OK	( ) Needs Revision*
6. Analysis Periods	( ) OK	( ) Needs Revision*
7. Technical Parameters	( ) OK	( ) Needs Revision*
8. Existing Lane Configurations	( ) OK	( ) Needs Revision*
9. Existing Road Network	( ) OK	( ) Needs Revision*
10. Intersection Analysis	( ) OK	( ) Needs Revision*
11. Roadway Segment Analysis	( ) OK	( ) Needs Revision*
12. Project Trip Generation	( ) OK	( ) Needs Revision*
13. Project Trip Reductions	( ) OK	( ) Needs Revision*
14. Project Trip Distribution	( ) OK	( ) Needs Revision*
15. Approved/Pending Trip Generation	( ) OK	( ) Needs Revision*
16. Approved/Pending Reductions	( ) OK	( ) Needs Revision*

17. Approved/Pending Distribution	( ) OK	( ) Needs Revision*
18. Project Only Trip Figure	( ) OK	( ) Needs Revision*
19. Significance Threshold	( ) OK	( ) Needs Revision*
20. Project Access Ques & LOS	( ) OK	( ) Needs Revision*
21. On-site drive-thru Ques	( ) OK	( ) Needs Revision*
22. Intersection LOS	( ) OK	( ) Needs Revision*
23. Roadway Segment LOS method	( ) OK	( ) Needs Revision*
24. Fair Share Calculation	( ) OK	( ) Needs Revision*
25. Traffic Calming Recommendation	( ) OK	( ) Needs Revision*
26. Potential Impacts Identified	( ) OK	( ) Needs Revision*
27. Appropriate and adequate mitigation	( ) OK	( ) Needs Revision*
28. Responsibility for mitigation	( ) OK	( ) Needs Revision*
29. Appendix included	( ) OK	( ) Needs Revision*
30. Other	( ) OK	( ) Needs Revision*

* See separate list for details of needed revisions.