

## **Section 20.1**

### **AJR NETWORK STUDY**

#### **20.1.1 PURPOSE**

The following study is to accompany the Access Justification Reports EDSM I.4.3.2.

#### **20.1.2 PROCEDURE**

There are 2 phases in the AJR study process. Phase 1 is for existing AJR network studies and Phase 2 is for alternative AJR studies.

##### **Phase 1 - AJR Existing Network Study:**

###### ***I. GROWTH RATES***

- A. Proposed growth rates
  - i. The sponsor will be expected to submit the proposed growth rates along with assumptions for each roadway within the study area for the existing network.
  - ii. Sponsor shall follow all applicable DOTD policy and guidance.

###### ***I. GROWTH RATE DELIVERABLES***

- C. Report of assumptions for growth rates.

###### ***II. DATA COLLECTION***

- A. Counts
  - i. Counts shall be taken when all schools are in session. No holiday weeks.
  - ii. Prior to the counts starting the DTOE and the Traffic Engineering Management (TEM) Section shall approve all count dates and times in writing.
  - iii. If counts exist, they must be no older than 2 years from date of initiation meeting.
  - iv. Exact count types and locations shall be spelled out in the MOU but at a minimum there should be:
    - 1. 7 day 24 hour counts and classification counts in both directions one per corridor for non-interstate routes within the study area
    - 2. For an IJR 7 day 24 hour counts and classification counts for both directions on the interstate one on each side of adjacent interchanges and one at proposed interchange site
    - 3. For an IMR 7 day 24 hour counts and classification counts for both directions on the interstate one each side of the interchange
  - v. The 7 day 24 hour counts shall be delivered to the TEM Section and the DTOE for approval of peak hour times. Turning Movement Counts (TMC) shall be taken during the approved hours. Typically

- there should be no more than 4 and no fewer than 2 turning movement counts per intersection. The turning movement counts shall include queue lengths every 15 minutes on each approach.
- vi. 48 hour counts and classifications shall be required for each approach of major intersections at the same time as the turning movement counts.
  - vii. 15 minute counts may be required at minor roadway approaches, driveways and median openings
- B. Signal Warrant Analysis for major intersections for existing conditions
- i. All MUTCD warrants
  - ii. If reduction is applicable, must analyze with reduction and at 100%
- C. Speed Study
- i. Minimum of 1 per corridor and within each speed zone
  - ii. Must meet requirements in EDSM VI.1.1.1
- D. Crashes
- i. All crash records are to be pulled for the last three years within the study area
  - ii. Summary of all crash types and locations
  - iii. Over represented crash type- each relevant crash report shall be read
  - iv. State Average comparison (intersections, segments, spots)
  - v. Existing Conflict types shall be identified
  - vi. Crash diagrams presented on an aerial
  - vii. Report given to DOTD to detail which crash reports were not reported correctly on the crash listing and what needs to be corrected
- E. Travel Time
- i. Average Vehicle Method utilizing the maximum car technique is to be used (TEM Section may approve other methods upon request)
  - ii. Minimum length of route shall be 1 mile
  - iii. Shall be run at each approved peak hour
  - iv. The number of runs for each peak hour shall be determined with a confidence level of 95%.
  - v. The date, time of run, weather, direction, starting location, ending location, trip length, trip time, travel speed, running time, stopped time, running speed shall be noted for each run.
  - vi. A summary with averages for all data points shall be completed for each peak hour.
- F. Peak hour Observations at Major Intersections and along corridors within study area
- i. Performed by a Professional Engineer licensed in Louisiana.

## **II. DATA COLLECTION DELIVERABLES**

- A. 7 day 24 hour counts with recommended peak hours for turning movement counts (TMC) {MUST BE APPROVED PRIOR TO PERFORMING ANY OTHER COUNTS}
- i. Electronic copy (excel or other approved software)
  - ii. Hardcopy showing hourly counts

- iii. Recommended peak hours
- B. Counts
  - i. 48 hour electronic copy (excel or other approved software) and hardcopy showing hourly counts
  - ii. Peak hour hardcopy showing TMC and 15 minute counts
  - iii. Layout of peak hour counts on map
- C. Warrant Analysis printout of warrants, volumes and which hours meet
- D. Speed Study printouts as described in EDSM VI.1.1.1
- E. Crashes
  - i. Crash diagrams for each major intersection
  - ii. Summary charts of overrepresented crashes
  - iii. Charts of State Averages
  - iv. Summary of conflict types
  - v. Report on incorrect crash reports
- F. Travel time runs
- G. Peak hour observations report given to DOTD highlighting any issues at the intersections within the study area such as queuing, turning conflicts etc.
- H. Layout on map for build and future analysis with % growth rate and traffic generator
  - i. Explanation of the traffic generator location assumptions and how growth was determined
- I. QA/QC documentation

### ***III. EXISTING NETWORK ANALYSIS***

- A. Software Analysis tools shall be defined in the MOU
  - i. No micro simulation tools shall be used in this step
- B. Scenarios for analysis for build year and design year as defined in MOU
  - i. Existing network no build
  - ii. Existing network with Transportation Systems Management (TSM) Alternatives for entire study area
    - 1. At a minimum, 4 alternatives are to be considered including the no build
  - iii. Analysis shall include network components within study area such as:
    - 1. Basic freeway segments
    - 2. Freeway Merge/Diverge segments
    - 3. Freeway Weaving Segments
    - 4. Major intersections
  - iv. Analysis results of network components with appropriate Measures of Effectiveness (MOE) shall be defined in the MOU. These may include but not limited to:
    - 1. Delay
    - 2. Travel Time
    - 3. Queue
    - 4. v/c

5. Density
6. LOS

**IV. *EXISTING NETWORK ANALYSIS DELIVERABLES***

- A. Report of results for each scenario during build and design year including:
  - i. Summary of assumptions, analysis and findings (All deliverables from A & B)
  - ii. Table of network freeway components and appropriate MOE
  - iii. Table of network major intersections and appropriate MOE
  - iv. Figures of lane configuration and layout to scale with aerial
  - v. Appendix with relevant software analysis output
  - vi. Signed and Stamped by Professional Engineer licensed in Louisiana
- B. Electronic files of report (pdf) and of the software analysis
- C. QA/QC documentation

**V. *MEETING***

The TEM Section will call a meeting to determine if the proposed TSM alternatives adequately address deficiencies defined in Purpose and Need and Goals and Objectives as outlined in the MOU

- A. Attendees:
  - i. Sponsor
  - ii. LADOTD Traffic Engineering Management
  - iii. LADOTD Safety
  - iv. FHWA
- B. Review of Existing Network Analysis Deliverables
- C. Decision to be made after meeting if AJR study continues
  - v. If study doesn't continue then alternative is chosen from the Existing Network Analysis
  - vi. If study does continue then MOU is modified and Phase II Alternative Analysis process begins

**Phase 2 - AJR Alternative Study:**

***I. ALTERNATIVE ANALYSIS DATA***

- A. Adjust Study Area
  - i. Should include a length of interstate for an interstate corridor study according to point 6 in the Federal CFR
- B. Volume Distribution Diagram
- C. Evaluation Criterion defined
  - i. Traffic Operations
  - ii. Right of Way
  - iii. Environmental/Social Impacts
  - iv. Costs
- D. Interchange Form Consideration/Screening Matrix
  - i. Perform Tier 1 Analysis (as described in ITE Freeway and Interchange Geometric Design Handbook): All interchange forms are considered and screened for fatal flaws. The process begins

with the identification of the “System-Area Environment” which identifies base conditions in terms of broad controls. The various interchange forms are considered based on the system area environment as described. These are then screened for fatal flaws. The screening considerations are then evaluated and decision making criterion established. By documenting the evaluation of alternatives in Tier 1, the planner/engineer considers all potential interchange candidates and records why some alternatives were eliminated from further study.

***I. ALTERNATIVE ANALYSIS DATA DELIVERABLES***

- A. Aerial outlining the adjusted study area with major intersections labeled
- B. A list of any new required data due to the adjusted study area
- C. Volume Distribution Diagram
- D. Interchange Screening Matrix
- E. QA/QC documentation

***II. ALTERNATIVE ANALYSIS DATA MEETING***

The TEM Section will call a meeting to determine which interchanges from Tier 1 analysis will move on to full alternative analysis

- A. Attendees:
  - i. Sponsor
  - ii. Sponsor’s consultant
  - iii. LADOTD Traffic Engineering Management
  - iv. LADOTD Traffic Engineering Development
  - v. LADOTD Safety
  - vi. FHWA
- B. Review of Alternative Analysis Data Deliverables
- C. Decision to be made at meeting which interchange types move to full alternative analysis (at least 3 alternatives)
- D. Discuss future study criteria for alternatives to be studied
  - i. MOE
  - ii. Software
- E. After meeting Study Criteria Memorandum will be distributed for review and signature by TEM Section

***III. STUDY CRITERIA MEMORANDUM***

The study criteria memorandum shall include:

- A. Volume distribution
- B. Software to be used for analysis of the 3 alternatives
- C. MOEs

The MOEs may include but are not limited to:

- i. Delay
- ii. Travel time
- iii. Queue
- iv. v/c

- v. Density
- vi. LOS
- vii. ROW/COA Cost
- viii. Construction cost
- ix. Known utility constraints
- x. Throughput
- xi. Conflict points (by type)
- xii. Geometric areas of concern
- D. Scaled conceptual drawings
- E. Timelines for submittals and reviews

**IV. FULL ALTERNATIVE ANALYSIS**

- A. Analysis will include network components within study area such as, but not limited to:
  - i. Basic Freeway segments
  - ii. Freeway Merge/Diverge Segments
  - iii. Freeway Weaving Segments
  - iv. Major Intersections
- B. Analyze the alternatives defined in the Study Criteria Memorandum to include:
  - i. MOEs as defined in the memorandum
  - ii. Future traffic and lane requirements for entire study area
  - iii. Public transportation plan, pedestrian and bicycle requirements
  - iv. Future highway network
  - v. Land use, environmental and right of way considerations
  - vi. ITS strategies and HOV facilities
  - vii. Design guidelines and criteria
  - viii. Safety analysis
    - 1. Include analysis of new conflict points. This may be accomplished using the predictive method in the HSM or another approved method.
- C. Prepare conceptual layouts to scale for each alternative to include at a minimum:
  - i. Identify utility conflicts
  - ii. Proposed and existing ROW
  - iii. Signing
  - iv. Striping
  - v. Geometric details
  - vi. Driveways and roadway connections with labels
  - vii. Drainage structures and bridges

**IV. FULL ALTERNATIVE ANALYSIS DELIVERABLES**

- A. Signed and stamped report by Professional Engineer licensed in Louisiana to include
  - i. Summary of findings
  - ii. Summary of analysis

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- iii. Summary of assumptions
- iv. Relevant Software analysis output
- v. Design guidelines and criteria
- vi. Safety analysis
- vii. MOE comparison for 3 alternatives, no build alternative and the alternative with TSM improvements for design and build year
  - 1. Table of network freeway components and appropriate MOE
  - 2. Table of network major intersections and appropriate MOE
- B. Electronic copy of software analysis
- C. Scaled Conceptual Layout

**V. *FINAL AJR SUBMITTAL***

- A. Combine all Deliverables into final report format
  - viii. Address all 8 points in Federal CFR
  - ix. Sign and Stamp by Professional Engineer licensed in Louisiana
- B. Check list
- C. 4 Hardcopies delivered to Traffic Engineering Management
- D. Electronic copy of report