

Executive Summary, Research Readiness Level Assessment, and Technology Transfer

Development of Accurate and Reliable Annual Average Daily Traffic Factoring Methods

Research Objectives

The primary objective of this project is to determine the most appropriate temporal adjustment factor for estimating AADT on the Nebraska highway systems. To accomplish this, the team will undertake a rigorous and comprehensive evaluation of the current AADT factor compared to alternative factors. The specific goals are to identify the most effective temporal adjustment factors among various options such as month of the year, week of the year, day of the week, and their combinations. It should be noted that the scope of this research is limited to NDOT-managed highway systems excluding interstates and local functional roads. In other words, the AADT factoring study in this project is limited to FHWA functional classes 2 to 6.

Research Benefits

If NDOT's current AADT estimation method needs to be updated, this project will create a tool to facilitate implementation. The tool will be developed using Microsoft Excel and Visual Basic for Applications (VBA). Input from the NDOT traffic analysis team will be sought to ensure that the tool aligns with their usage needs and preferences. It is expected that the NDOT traffic analysis team will be able to use the developed tool immediately upon the completion of this research project. The project team is committed to offering ongoing support for the tool beyond project completion.

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Background

According to the Federal Highway Administration (FHWA), "Annual Average Daily Traffic (AADT) estimates, with as little bias as possible, the mean traffic volume across all days for a year for a given location along a roadway". AADT provides crucial information about road activity in terms of vehicular volume (i.e., vehicles per day) on specific road segments. As such, it plays a pivotal role in supporting highway agency activities that include planning, design, maintenance, operations, safety, environmental analysis, finance, engineering economics, and performance management. Moreover, AADT serves as a key parameter for the allocation of funds to state Departments of Transportation (DOTs). Nebraska DOT (NDOT) is required to collect and report AADTs to the FHWA annually as part of the Highway Performance Monitoring System program, as well as make these data publicly available. This is because AADTs are used by a wide range of stakeholders in Nebraska, including NDOT divisions, city traffic engineers, and private consultants. Therefore, providing accurate AADTs is imperative, while using inaccurate AADTs in one or more of the mentioned studies would result in direct economic losses for the state.

Conclusion

Accurate estimation of Annual Average Daily Traffic (AADT) is essential for the Nebraska Department of Transportation (NDOT) to support planning, design, safety evaluation, asset management, and federal reporting requirements. Because continuous traffic monitoring is not feasible at every roadway location, NDOT relies on short-term traffic counts that are expanded to annual values using temporal adjustment factors (TAFs). The selection of appropriate temporal factors directly affects the reliability of AADT estimates and, consequently, the quality of transportation investment decisions. NDOT's current practice primarily relies on month-of-the-year-based adjustment factors, with additional day-of-week considerations. While this approach follows national guidance, the performance of alternative temporal adjustment structures has not been systematically evaluated under Nebraska-specific traffic conditions. Differences in seasonal variation, holiday effects, and roadway functional characteristics may influence the accuracy of various temporal aggregation levels. Therefore, a comprehensive assessment of candidate temporal adjustment factors was necessary to determine the most accurate and reliable approach for estimating AADT from short-term counts in Nebraska. Eleven temporal adjustment factor structures were evaluated, ranging from monthly to daily and week-based configurations. Performance was assessed using error-based metrics that compare estimated AADT values against ATR-derived annual averages. To support implementation, this project developed an Excel-based tool that incorporates the three recommended temporal adjustment factors. The tool automates data formatting, factor calculation, AADT estimation, and error evaluation. It is designed to be user-friendly and compatible with NDOT's existing workflow, minimizing implementation barriers. The tool allows engineers to select among the recommended factor options depending on data availability and operational needs. The findings of this study provide NDOT with a data-driven basis for improving AADT estimation practices. Adoption of the recommended temporal adjustment factors, particularly in combination with 48-hour short-term counts when feasible, can enhance the reliability of AADT values used in planning, safety analysis, and funding allocation decisions. The accompanying implementation tool further facilitates the application of the research results.

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Final report is available:
[HERE](#)

NDOT Recommendations Based Off Research Project – 2026 – RRL4

This research evaluated the performance of current and alternative Temporal Adjustment Factors (TAFs) for calculating Annual Average Daily Traffic (AADT) under Nebraska-specific traffic conditions. It also provided an AADT Factoring Tool spreadsheet to calculate TAFs based on traffic count data. The evaluation validated the effectiveness of the NDOT's current month-of-the-year with day-of-week considerations method and found three marginally superior methods: Week of the Year × Day of the Week, Week of the Year (5-day), and Day of the Year.

The Department intends on implementing one of these methods; however, the research implementation is currently tabled due to an upcoming change in software. The Department will migrate off Mainframe, which currently stores TAFs and calculates AADT data. Once an alternative service is selected, the Department will move forward implementing one of the three recommended TAF methods. The spreadsheet provided will help with the transition. In the meanwhile, this research will be included in Strategic Planning's Traffic Data Collection's 5-Year Business Plan.

- As provided by Nam Nguyen and Nolan Lund, Lead TAC Members

Research Readiness Level (RRL) Assessment Level 4: Implementation

RRL 4

Benefits of implementation will be followed up on in 5 years.

Technology Transfer

Transportation Research Board (TRB) papers and Publications

- Zhao, L. (2026). "Comprehensive Assessment of Temporal Adjustment Factors for Estimating AADT", 105th Annual Meeting TRB. Presented January 12, 2026.

**This brief summarizes Project SPR-FY25(048)
"Development of Accurate and Reliable Annual Average Daily Traffic Factoring Methods"
Nebraska Department of Transportation Research Program**