

Traffic Forecasting Administrative Policy Manual

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Overview

Introduction The North Carolina Department of Transportation (NCDOT) is the state agency responsible for improving, operating and maintaining the state’s transportation system. Within NCDOT, the Transportation Planning Division and its local partners are responsible for long range transportation planning. While the Transportation Planning Division focuses on identifying long range needs and potential improvements, staff are also responsible for providing travel demand information to support project-level design decisions. Project-level traffic forecasts are key inputs into project design studies, roadway and intersection design, pavement design, and environmental studies which lead to the construction of transportation improvements. Project-level traffic forecasts estimate future traffic volumes for defined highway projects.

Purpose of this manual There are two general purposes of the *Traffic Forecasting Administrative Policy Manual*:

- to provide the public, traffic forecast customers, and decision-makers a brief description of the process used by the Traffic Forecasting Group to develop project-level traffic forecasts; and
- to help persons involved in the traffic forecasting process understand their roles and responsibilities.

Limitations of this manual This manual is not designed as an instructional guide on how to prepare a traffic forecast. It is the responsibility of the Forecaster to have sufficient skills and judgment in transportation planning to apply the policies contained within this manual during the development of a traffic forecast.

Further information on the process of developing a traffic forecast and guidance for preparing a traffic forecast is provided in other publications, which are described in the following section.

Relationship between manuals This manual is one of several publications by the Transportation Planning Division which relate to traffic forecasting. These publications, used as a collective whole, are intended to provide the forecaster a complete guide for the definition and development of a traffic forecast.

- The *Traffic Forecasting Administrative Policy Manual*. This publication describes the process of requesting, developing, reviewing, and delivering a traffic forecast. It also describes the roles and responsibilities of the various people involved in that process.
 - The *Traffic Forecasting Technical Policy Manual*. This publication describes the technical requirements which must be satisfied for the TFG to approve a traffic forecast.
 - Traffic forecasting technical guidance. This series of publications elaborate upon and support the content of the two aforementioned documents. Detailed guidance and procedures related to the development of a traffic forecast are offered to help the Forecaster prepare a traffic forecast.
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Uses of a traffic forecast

Traffic forecasts are used by customers to:

- Prepare preliminary cost estimates for use in the development of the State Transportation Improvement Program (STIP);
 - Identify purpose and need for a highway project; prepare preliminary designs; and evaluate alternative project designs;
 - Design roadway construction plans;
 - Design the type of pavement to be used for roadway improvements;
 - Analyze the capacity of roadway facilities and design traffic operation improvements;
 - Prepare bridge construction plans; and/or
 - Make maintenance and minor roadway improvement decisions.
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Traffic forecasting process

The Appendix depicts the process used to request, develop, and approve a traffic forecast.

Variations

A variance to the policies presented within this Manual may be requested by the forecast requester or the Forecaster in writing to the Traffic Forecasting Group (TFG) Supervisor. The reason for the variance must be explained as part of the variance request. Appeals to any decision made by the TFG Supervisor may be directed to the TPD Technical Services Unit Head.

Versions

This manual replaces the previous version dated March 20, 2019.

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1. Definitions of Terms and Persons

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|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TPD | The Transportation Planning Division (TPD) of the NCDOT. |
| PEF | Professional Engineering Firm (PEF). A firm under contract with the NCDOT to provide professional services which has been determined by the NCDOT to be qualified to perform professional services in project level traffic forecasting. |
| Forecaster | The person who is assigned the task of preparing a traffic forecast for NCDOT. This person can be from the staff of the Traffic Forecasting Group (TFG), the TPD, other divisions within the NCDOT, or from the staff of a PEF. |
| Model Research & Development Group | The organizational unit within TPD responsible for the development and maintenance of travel demand models. This group is also the custodian of most travel demand models within the State of North Carolina. |
| Planning group supervisor | The person serving as supervisor for any of the regional planning groups within TPD. Planning groups are responsible for the preparation of Comprehensive Transportation Plans and for coordination of transportation planning activities with Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs) within the assigned region. |
| Traffic Forecast | <p>The official document that contains information about current and/or future vehicular traffic volumes for use in developing a specific roadway improvement project. The Traffic Forecast is intended to provide sufficient information for decision-makers to determine one or more long-range planning, programming, project development and/or final design aspects of a roadway improvement project (defined as physical and/or operational improvements within the public right-of-way). A traffic forecast may be in the form of a traffic estimate or a project level traffic forecast. Both products consist of a traffic forecast technical report and the graphical presentation of traffic data.</p> <ul style="list-style-type: none">• <i>Traffic Estimate</i>: A technical document with sufficient traffic information to support long-range planning, project programming, and early phases of project development. The purpose of a traffic estimate is to help determine a purpose and need for a highway project as well as the |

number of through lanes which are required for a highway facility. A traffic estimate typically is limited in scope to current and future-year Annual Average Daily Traffic (AADT) for roadway segments, therefore, some of the policies contained in this Manual do not apply to a traffic estimate.

- *Project-Level Traffic Forecast*: A technical document that contains sufficient current-year and/or future-year traffic statistics to support design decisions for a roadway improvement project. A project-level traffic forecast usually includes AADT volumes for through and turning movements, truck percentages, peak hour factors and directional distribution for the study area network. Traffic statistics for the base year (customarily the current year) and one or more future years are provided.

Traffic Forecast Requester A person within NCDOT, or a person from a PEF under contract with NCDOT, who seeks a traffic forecast for current and/or future years

Traffic Forecasting Group (TFG) The organizational unit within TPD which is responsible for the following:

- Creation and promulgation of standards relating to traffic forecasting,
- Production of traffic forecasts, and
- Review and approval of traffic forecasts prepared by PEFs.

TFG Supervisor The head of the Traffic Forecasting Group with general supervision over the traffic forecasting process, procedures, and personnel.

TFG Project Manager The working title for staff persons within the TFG who are assigned the tasks of receiving requests for traffic forecasts, and/or managing the preparation of traffic forecasts by PEFs.

Traffic Survey Group The organizational unit within TPD responsible for the collection, analysis, maintenance and publishing of traffic data and statistics.

2. Identify the Need for a Traffic Forecast

Overview The need for a traffic forecast is identified by any of the project development teams within NCDOT and by staff of the Traffic Forecasting Group. Findings are communicated between these groups for the purpose of reaching consensus on the need for a traffic forecast.

Who may identify a need? The need to prepare a traffic forecast may be identified by any of the following persons or groups:

- Project development teams—NCDOT central and division offices,
- Project development teams—PEFs, or
- The Traffic Forecasting Group (TFG).

How is a need determined? The need for a traffic forecast may be determined through any one of several work processes:

- A project-development team working on a roadway project may determine the need for current and/or future traffic statistics.
- The TFG may obtain project lists from project-development teams to determine the timeliness and readiness of a project to begin development of a traffic forecast.
- The TFG may screen roadway improvement projects to determine if a new or updated traffic forecast is needed.

When is a traffic forecast not needed? The TFG may determine that a new or updated traffic forecast is not needed if:

- Current-year AADT is less than 4000.
Note: This applies to bridge replacement projects only.
- The previous traffic forecast for the project is judged to be valid for current needs.
- Information from a traffic forecast for a geographically related project is available.

3. Prepare a Request for a Traffic Forecast

Overview This section describes who may prepare a request, what information to include in a request, and where to submit a request.

Policy: Who may submit a request? A traffic forecast request may be submitted by any member of a NCDOT project development team.
Note: PEFs must submit a request through their NCDOT project manager.

Prepare the request The Traffic Forecast Requester prepares a request by using either of the media listed below.

- Traffic Forecast Request Form, available through the following link: (https://connect.ncdot.gov/projects/planning/TPB%20Systems%20Planning/FORECAST_REQUEST_FORM%202018%20Update.docx), or
- Email message.

Policy: Required information The information listed below must be furnished within a traffic forecast request. This information will help the Forecaster understand the nature of the project and what the Traffic Forecast Requester needs.

- Description of the project: What improvement is being pursued?
- Definition of the study area: Identify the roadway links and intersections to include within the traffic forecast.
- Project number or other identification (e.g., STIP #, Prioritization ID#).
- WBS number with which to charge staff time and expenses.
- Date when the forecast is required.

Submit the request The Traffic Forecast Requester should send the request to the TFG by email message at service account TrafficForecast@ncdot.gov.

Expectations: Traffic Forecast Requester The Traffic Forecast Requester is expected to immediately notify the Forecaster if any of the following events occur:

- The project is cancelled or suspended.
- Additional project design scenarios are needed.
- Project design scenarios are no longer needed.
- Forecast delivery needs to be expedited or may be delayed.

- Project development meetings are set that could be useful in the development of the traffic forecast.
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4. Assign a Traffic Forecast

Overview This section describes the policy and process related to how the TFG assigns a traffic forecast to the Forecaster.

Policy: Responding to a traffic forecast request TFG will respond to a traffic forecast request within two weeks by:

1. Contacting the Traffic Forecast Requester to seek clarification of the request and/or completion of required information, or,
2. Responding to the Traffic Forecast Requester by email message with the information listed below.
 - Name of the Forecaster assigned to prepare the Traffic Forecast,
 - Scheduled delivery date, and
 - Type of traffic forecast to be produced.

Task: Forecast parameters The TFG Supervisor or the TFG Project Manager will determine the parameters listed below before a traffic forecast request is transmitted to the Forecaster.

- Delivery due date,
- Define No-Build and/or Build scenarios,
- Base year estimate and/or future year forecast,
- Traffic estimate or project-level traffic forecast, and
- Clarification and confirmations required from the Traffic Forecast Requester.

**Process:
Assigning a
traffic forecast**

Upon receipt of a traffic forecast request the TFG will process the request as follows:

| Stage | Who | Description |
|-------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | TFG Project Manager | Consult with the TFG Supervisor to determine whether the forecast will be prepared by TFG staff or by an on-call PEF. |
| 2a | TFG Supervisor | For forecasts to be prepared by TFG staff: <ol style="list-style-type: none"> 1. Determine the parameters of the traffic forecast. 2. Forward the request, with instructions, to the Forecaster. 3. Respond to Traffic Forecast Requester. |
| 2b | TFG Project Manager | For forecasts to be prepared by a PEF: <ol style="list-style-type: none"> 1. Determine the parameters of the traffic forecast. 2. Assign to an on-call PEF. 3. Respond to Traffic Forecast Requester. |
| 3 | TFG Project Manager | Begin to track the request, including: <ul style="list-style-type: none"> • Date of receipt, • Name of the Forecaster, and • Delivery due date. |

5. Develop the Traffic Forecast

Overview This section outlines the expectations of the Forecaster and TPD staff who are involved in the development of the Traffic Forecast.

Clarify scope The Forecaster may contact the Traffic Forecast Requester to clarify the study area, type(s) of improvements planned, alternative improvement scenarios, assumptions to make, etc.

Expectations: Forecaster The Forecaster will endeavor to prepare the Traffic Forecast with the following expectations:

- Prepare the traffic forecast in accordance with the *Traffic Forecasting Technical Policy Manual* and associated technical guidance.
- Deliver the completed Traffic Forecast by the assigned due date.
- Consult with TPD planning groups to obtain information on MPO and RPO plans and studies, and to request travel demand model edits and runs.
- Consult with TPD Model Research and Development Group to obtain travel demand model administrative data and loaded networks.
- Furnish a count location map to the Traffic Survey Group when traffic counts are ordered through the Transportation Mobility & Safety Division.

Expectations: Planning groups The regional planning groups contribute substantially to the development of a traffic forecast through providing information and opinions to the Forecaster. The following support is expected from the Planning groups:

- Information about ongoing planning projects within the region (e.g., municipalities, counties, RPOs, MPOs, and CTPs).
- Interpretation of information within MTPs.
- Recommend local government agency contacts.
- Perform the tasks and responsibilities assigned to the Planning groups in the *Official Travel Demand Model Guidance*, such as checking the consistency between a TDM (e.g., highway networks and SE data) and its corresponding MPO metropolitan transportation plan.
- Serve as the point of contact to edit and run TDMs when requested by the Forecaster (applies to *TPD staff only*). The regional Planning Group may seek technical assistance from the Model Research & Development Group as needed. This task should be completed within following

timeframe after receiving a list of pertinent changes from the Forecaster:

- Two weeks for non-regional models involving 4 or fewer model runs.
- Three weeks for regional models involving 4 or fewer model runs.
- The timeframe needed to complete model work exceeding 4 model runs will be negotiated on a case-by-case basis.

**Expectations:
Model Research
& Development
Group**

The Model Research & Development Group provides an essential supporting role in the development of a traffic forecast. Expectations for this group are:

- Serve as model custodian for TDMs consistent with the *Official Travel Demand Model Guidance*.
- Maintain and publish administrative data for all official models, including adoption date, model version number, and running log of technical changes.
- Provide technical assistance to the regional Planning groups for editing and running TDMs, as needed.
- Provide on-line access to loaded model networks for all TDMs – including the three regional models (*i.e.*, the MRM, PTRM, and TRM).

**Expectations:
Traffic Survey
Group**

The Traffic Survey Group (TSG) provides an important supporting role in the development of a traffic forecast. The expectations for this group are:

- Provide timely notice of the addition and deletion of TSG products.
 - Process traffic counts of less than 24 hours duration into 24-hour volume reports when requested by the Forecaster (*applies to TPD staff only*). This task shall be completed within two weeks.
 - Provide guidance on the use of traffic data and statistics (e.g., truck percentages, seasonal data) to the Forecaster.
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6. Review the Draft Traffic Forecast

Policy: Review the draft Traffic Forecast

Each draft Traffic Forecast shall be reviewed by the TFG Supervisor or the TFG Project Manager, and by the geographic Planning group in which the project is located.

Process: Review draft Traffic Forecast prepared by TFG staff

The Forecaster will initiate the process of reviewing the draft Traffic Forecast as described in the table below.

| Stage | Who | Description |
|-------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Forecaster | Submit the draft Traffic Forecast to the Traffic Forecasting Group Supervisor. |
| 2 | TFG Supervisor | Review the draft Traffic Forecast and provide comments to the Forecaster. Note: This is an iterative process until the forecast is approved by the TFG Supervisor. |
| 3 | TFG Supervisor | <ul style="list-style-type: none"> • Forward the draft Traffic Forecast to the supervisor of the regional planning group. • May forward the draft Traffic Forecast to a TFG Project Manager. • Establish a date when review comments are due. |
| 4 | TFG Project Manager & Planning Group Supervisor | Review the draft Traffic Forecast and furnish any comments to the Forecaster within the specified time. Note: 7 to 14 days are usually allowed for review. Note: If no comments are offered, an email message should be sent accordingly to the Forecaster. |

Process: Review draft Traffic Forecast prepared by a PEF

The PEF Forecaster will initiate the process of reviewing the draft Traffic Forecast as described in the table below.

| Stage | Who | Description |
|-------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Forecaster | Submit the draft Traffic Forecast to the TFG Project Manager. |
| 2 | TFG Project Manager | Screen the draft Traffic Forecast for completeness and gross errors. Note: If incomplete or if gross errors are found, return the draft Traffic Forecast to the Forecaster with comments. |
| 3 | TFG Project Manager | <ul style="list-style-type: none"> • Forward the draft Traffic Forecast to the supervisor of the regional Planning group. • Establish a date when review comments are due. |
| 4a | TFG Project Manager | Review the draft Traffic Forecast. |
| 4b | Planning Group Supervisor | Review the draft Traffic Forecast and furnish any comments to the TFG Project Manager within the specified time. Note: 7 to 14 days are usually allowed for review. |
| 5 | TFG Project Manager | Transmit comments to the PEF Forecaster. |

Standard of review: Planning groups

A detailed list of items to check during the review of a forecast is impractical and inappropriate—Planning group staff is expected to think about the relation of the Traffic Forecast to what they know about the planning area. Particular attention should be made on:

- Consistency of forecast assumptions with adopted plans and studies within the forecast area.
- General logic of the traffic forecast.

Note: TFG reviewers will look at the presentation of information and balancing. Planning group staff should not be concerned with these topics.

Standard of review: TFG Project Manager

The TFG Project Manager has the primary responsibility for ensuring the quality of traffic forecasts prepared by a PEF. The draft Traffic Forecast will be reviewed in accordance with the standards listed below.

- Consistency with the *Traffic Forecasting Technical Policy Manual* and published traffic forecasting technical guidance,
 - Balancing of volumes on the forecast diagrams,
 - Consistency of forecast assumptions with adopted plans and studies within the forecast area (e.g., MTP, small-area plan, land use plan, TDM),
 - General logic of the Traffic Forecast,
 - Legibility of graphical content,
 - Substantial omission of data or information, and
 - Substantial errors of fact.
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7. Complete and Deliver the Traffic Forecast

Overview

This section describes the tasks that are necessary to complete and deliver the Traffic Forecast.

Policy: Approval of the Traffic Forecast

The Forecaster will complete the Traffic Forecast only after receiving written approval from the Traffic Forecasting Group as identified below.

| Traffic forecast prepared by | Approval agent |
|------------------------------|-------------------------------------------|
| TPD | TFG Supervisor |
| PEF | TFG Project Manager, or TFG Supervisor |

Procedure: Complete and deliver the Traffic Forecast

The Forecaster will complete the Traffic Forecast by performing the following steps:

| Step | Action |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Respond to reviewers who provided comments on the draft Traffic Forecast. Note: Only substantial comments need to be responded to. |
| 2 | Prepare the final Traffic Forecast. This usually entails making edits based on review comments, adding the current date, then creating a PDF version of the Traffic Forecast document. |
| 3 | Receive approval for the final Traffic Forecast – refer to the policy above. |
| 4 | Deliver a PDF version of the Traffic Forecast via email attachment to the Traffic Forecast Requester, the TFG Supervisor, and the TFG Project Manager. |

Task: Track the Traffic Forecast

The TFG Project Manager will complete the tracking of the Traffic Forecast (e.g., recording the delivery date).

8. Add to Traffic Forecast Libraries

Introduction

The completed Traffic Forecast is added to traffic forecast libraries as described below. The libraries are intended to provide convenient access for those who wish to obtain information on Traffic Forecasts that have been completed.

Procedure: File electronic documents

The Traffic Forecast electronic documents will be filed as noted below.

| Step | Who | Action |
|------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 1a | Forecaster (TFG staff only) | Place the original electronic documents in the traffic forecast project folder in <u>S:/Traffic Forecast Projects/</u> . |
| 1b | Forecaster (PEF) | Forward a PDF document of the Traffic Forecast to the TFG Project Manager. |
| 2 | TFG Project Manager | Place a PDF document of the Traffic Forecast in the appropriate alphabetic folder within <u>S:/Traffic Forecast Projects/Archived Forecasts</u> . |
| 3 | TFG Project Manager | Place the traffic forecast in the Traffic Forecasts Library in <u>Connect.ncdot.gov</u> . |

Procedure: Update GIS shapefile

reserved for future use

Appendix : Traffic Forecasting Flowchart

