

# TRANSPORTATION SYSTEMS (PHD)

NYSED: 08812 HEGIS: 0908.00 CIP: 14.0804

## Program Description

The PhD in Transportation is a research-oriented degree intended for those whose goal is a career in basic transportation research and/or teaching at the Institute level or in private research organizations.

## Program Requirements

Students pursuing the PhD in Transportation Planning and Engineering generally specialize in one of the following subject areas:

- Transportation planning
- Traffic engineering
- Intelligent transportation systems
- Transportation safety

Other focus areas are possible and can be developed with the help of faculty advisers. All subject areas, of course, must be relevant to the degree sought and have a faculty member willing and able to guide the student's research.

## Program Administration

All graduate applications are processed through the civil engineering departmental office, which distributes applications to the graduate coordinator. Graduate program coordinators formally implement admission decisions, in accordance with departmental regulations.

The graduate coordinators consult with the departmental Graduate Committee. All PhD applications are reviewed by the committee, and admissions decisions are made by the committee and implemented by the graduate coordinator.

For each registration, the student's program must be approved by their individual academic adviser.

## Admissions

Admission to graduate programs in the Tandon School of Engineering requires the following minimum components:

- Résumé/CV
- Statement of Purpose
- Letters of Recommendation
- Transcripts
- Proficiency in English

The NYU Tandon Graduate Admissions website (<https://engineering.nyu.edu/admissions/graduate/apply/requirements/>) has additional information on school-wide admission.

Some programs may require additional components for admissions.

See the program's How to Apply (<https://engineering.nyu.edu/admissions/graduate/how-apply/>) for department-specific admission requirements and instructions.

## Admission Criteria to PhD Program

Admission to the PhD in Transportation Planning and Engineering requires an MS in Transportation Planning and Engineering or equivalent, with a GPA of 3.5 or better (on a 0-4 scale).

All applicants are required to submit GRE scores for consideration. Foreign applicants must take the TOEFL examination and submit the results for consideration.

The "equivalent" of the MS degree can be achieved in several ways. The candidate may have an MS degree with a different title that covers substantially the same material. More generally, applicants must demonstrate that they have the equivalent of all undergraduate and master's level course work in order to pursue doctoral level work in the major area. Further, "equivalence" is evaluated based on the totality of the student's undergraduate and graduate record, not course-by-course.

Because admission to a PhD program requires a related MS (or equivalent), those applicants who have not yet achieved a master's degree would normally be admitted as MS students. They are expected to earn an MS degree while completing their major and minor course requirements. In rare cases, an applicant with only a BS degree may be directly admitted into the PhD program with the written approval of the department head and will be required to take all courses needed for the MS degree with an overall GPA of 3.5.

## Doctoral Committees

Upon admission, every PhD student is assigned an academic adviser, who is selected by the PhD committee. Any member of the civil engineering faculty can be an academic adviser to a graduate student. In cases where a student is supported on a research contract, the principal investigator of the contract would normally be appointed as the academic adviser for the student. Where a student has a particular research interest and is working with a particular faculty member, the student may request that the faculty member be appointed as academic adviser. In rare cases where a PhD student enters the program without a prior selection of a major area of study, the initial academic adviser will be the Graduate Coordinator of the transportation program.

In fulfilling their academic requirements, PhD candidates will deal with two advisory committees:

### Academic Advisory Committee

The student's academic adviser works out a program of courses to fulfill major and minor requirements for the PhD. The Academic Advisory Committee generally will comprise the academic adviser and one faculty member for each minor area of study. The Academic Advisory Committee guides the PhD student's work through the successful completion of a qualifying examination. A letter signed by the academic adviser and approved by the department head is placed in the student's file, indicating the composition of the Academic Advisory Committee.

### Dissertation Committee

The Dissertation Committee is formed immediately after the student passes the qualifying examination. It comprises a major adviser, a dissertation adviser and a minor adviser for each minor the student has pursued. Additional faculty members may also be on the Dissertation Committee. The Dissertation Committee may be the same as the Academic Advisory Committee, or may be different. The Dissertation Committee guides the student's course and research work after the student has passed the qualifying examination. The Dissertation

Committee must be formally assigned and approved by the department head and filed with the Office of Graduate Academics. The major adviser must be a fulltime faculty member of the Department of Civil and Urban Engineering. The major and dissertation adviser may be the same individual.

## Program Requirements

The PhD requires the completion of 75 credits, comprised of the following:

Course	Title	Credits
<b>Major Requirements</b>		
TR-GY 7013	Urban Transportation & Logistics Systems	3
TR-GY 6113	Forecasting Urban Travel Demand	3
TR-GY 7083	Analytics and Learning Methods for Smart Cities	3
TR-GY 7353	DATA-DRIVEN MOBILITY MODELING & SIMULATION	3
TR-GY 6053	TRANSPORTATION ECONOMICS AND FINANCE FUNDAMENTALS	3
RE-GY 9990	PHD QUALIFYING EXAM	0
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING (taken 8 times, for a total of 24 credits)	3-12
<b>Electives</b>		
Other Elective Credits		36
<b>Total Credits</b>		<b>75</b>

## Additional Program Requirements

### Qualifying Examination

Departmental qualifying examinations for the PhD in Transportation Planning and Engineering are given once a year (usually in May or June) and are coordinated with other qualifying examinations in the department. If sufficient demand exists, a second qualifying examination may be scheduled in November or December. Every PhD student must pass a qualifying examination in the major area of study and in any in-department minor areas of study before becoming a candidate for the PhD. Further:

- No student may register for dissertation credits until the Qualifying Examination is passed.
- A Dissertation Committee cannot be formed until the student passes the Qualifying Examination.
- A student may take the Qualifying Examination twice. A third attempt is permitted only with the written recommendation of the Academic Advisory Committee and the approval of department head. In no case may a student take the examination more than three times.
- Students normally take the Qualifying Examination (for the first time) after successfully completing most of their course requirements in the major and in department minor areas of study.

The Qualifying Examination consists of a five-hour written portion and an oral portion of approximately one hour. Both written and oral portions of the examination focus on the student's major and in-department minor. The oral portion may also explore higher-level skill areas required to successfully conduct independent research. Students are deemed to have passed the examination based upon an overall evaluation of the written and oral results. While some students may not be invited to the oral examination if they have done poorly in the written portion, invitation

to the orals does not imply that the student has "passed" the written portion of the exam.

The Qualifying Examination is either "passed" or "failed." A letter indicating the result of each examination is placed in the student's graduate file. In rare cases, a student may be deemed to have "conditionally passed" the Qualifying Examination. This conditional status occurs in cases where the student does extremely well in all areas except for a single subject area in which weakness has been noted. Such students must follow a prescribed plan to strengthen their knowledge and skills in the area of weakness and must pass a special examination on the area of weakness within one calendar year. A student who has "conditionally passed" the Qualifying Examination may register for dissertation credits and may form a Dissertation Committee.

All transportation faculty members participate in submitting written problems for the qualifying examination, and in the grading process and in the oral examination. All departmental faculty members are welcome to observe any oral examination and to ask pertinent questions. Each student's Academic Advisory Committee will have the opportunity to review the entire exam before it is administered and may suggest changes if it deems that the examination as presented is an inequitable test of the student's abilities. Recommendations on the results of the examination are submitted by each student's Academic Advisory Committee, augmented by any departmental faculty in the subdisciplines tested.

### Dissertation Proposal

Following passage of the Qualifying Examination and the appointment of a Dissertation Committee, the PhD candidate must submit a written Dissertation Proposal, outlining the subject of the proposed research. This proposal should be between 15 and 20 pages long and should address the following specific items:

- Description of the topic
- Literature review sufficient to insure that the work contemplated is original
- Research methodology(ies) to be used
- Data and/or laboratory needs and their availability to the student
- Anticipated outcomes

The Dissertation Proposal must be submitted after one semester of registering full time for dissertation credits, or before 9 credits of dissertation credit are completed.

The Dissertation Proposal is orally presented and defended before the Dissertation Committee and other interested departmental faculty. The date of the oral defense and copies of the draft Dissertation Proposal must be made available to department faculty at least two weeks (14 calendar days) before the defense.

When the Dissertation Proposal is formally accepted, the Dissertation Adviser enters a letter into the student's graduate file, indicating this acceptance, with a copy of the proposal. While the Dissertation Committee has reasonable flexibility to modify the proposal during the research, any significant change in focus area or methodology requires that an amended Dissertation Proposal be written and formally accepted following the same procedure noted herein.

### Dissertation Defense

The culmination of the student's PhD work is the oral presentation and defense of the final draft dissertation. A defense is generally scheduled

after the Dissertation Committee has reviewed the draft dissertation and determined that it is complete and of sufficient quality to be presented and defended. By this time, it is also required that a paper based on the dissertation has been submitted to a peer-reviewed journal for publication, details to be worked out with the dissertation advisor.

The defense is organized and scheduled by the Dissertation Committee. All Institute faculty members are invited to observe and ask questions at all NYU Tandon dissertation defenses. Therefore, the date of the defense must be announced Institute-wide at least one month before the event, and copies of the draft dissertation must be available to any faculty member requesting one in a timely fashion and in no case less than two weeks before the defense.

## Sample Plan of Study

Course	Title	Credits
<b>1st Semester/Term</b>		
TR-GY 7013	Urban Transportation & Logistics Systems	3
TR-GY 6113	Forecasting Urban Travel Demand	3
TR-GY 7083	Analytics and Learning Methods for Smart Cities	3
<b>Credits</b>		<b>9</b>
<b>2nd Semester/Term</b>		
TR-GY 7353	DATA-DRIVEN MOBILITY MODELING & SIMULATION	3
TR-GY 6053	TRANSPORTATION ECONOMICS AND FINANCE FUNDAMENTALS	3
RE-GY 9990	PHD QUALIFYING EXAM	0
Elective		3
<b>Credits</b>		<b>9</b>
<b>3rd Semester/Term</b>		
Elective		3
Elective		3
Elective		3
<b>Credits</b>		<b>9</b>
<b>4th Semester/Term</b>		
Elective		3
Elective		3
Elective		3
<b>Credits</b>		<b>9</b>
<b>5th Semester/Term</b>		
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING	3-12
Elective		3
<b>Credits</b>		<b>6</b>
<b>6th Semester/Term</b>		
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING	3-12
Elective		3
<b>Credits</b>		<b>6</b>
<b>7th Semester/Term</b>		
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING	3-12
Elective		3
<b>Credits</b>		<b>6</b>
<b>8th Semester/Term</b>		
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING	3-12
Elective		3
<b>Credits</b>		<b>6</b>
<b>9th Semester/Term</b>		
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING	3-12

Elective		3
<b>Credits</b>		<b>6</b>
<b>10th Semester/Term</b>		
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING	3-12
<b>Credits</b>		<b>3</b>
<b>11th Semester/Term</b>		
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING	3-12
<b>Credits</b>		<b>3</b>
<b>12th Semester/Term</b>		
TR-GY 999X	PHD DISSERTATION IN TRANSPORTATION PLANNING & ENGINEERING	3-12
<b>Credits</b>		<b>3</b>
<b>Total Credits</b>		<b>75</b>

## Learning Outcomes

Upon successful completion of the program, graduates will:

1. Develop a strong and deep fundamental knowledge about the profession of transportation planning and engineering.
2. Develop the knowledge and skills to perform independent fundamental research in transportation planning and engineering.
3. Produce fundamental research that meaningfully advances the state-of-the-art of the profession of transportation planning and engineering.

## Policies

### NYU Policies

University-wide policies can be found on the New York University Policy pages (<https://bulletins.nyu.edu/nyu/policies/>).

### Tandon Policies

Additional academic policies can be found on the Tandon academic policy page (<https://bulletins.nyu.edu/graduate/engineering/academic-policies/>).