

Gopal R. Patil

gpatil@iitb.ac.in, patilg@gmail.com

Office Address

Department of Civil Engineering
Indian Institute of Technology Bombay
Powai, Mumbai 40076
Ph:+91-22-2576-7308/7301, Fax: +91-22-2576-7302

CAREER OBJECTIVE

To become a leading researcher and an inspirational teacher in transportation engineering

RESEARCH EXPERTISE

Transportation Systems Planning; Network Optimization; Freight Transportation Modeling; Traffic Operations; Transportation Economics

POSITIONS

Assistant Professor Department of Civil Engineering, IIT Bombay	May 2009 - present
Lecturer School of Engineering, University of Vermont, Burlington	Aug 2008 – Apr 2009
Research Engineer National Transportation Research Center, University of Vermont, Burlington	Nov 2007 – Apr 2009
Transportation Consultant Frischmann Prabhu (India) Pvt. Ltd. Mumbai, India	Apr 2002 – Jul 2003

EDUCATION

- **Ph. D.** Nov 2007
Rensselaer Polytechnic Institute, Troy, NY
Department of Civil and Environmental Engineering, (Concentration: Transportation Engineering)
Dissertation: Modeling Flexibility in Stochastic Transportation Networks
- **Master of Technology (M. Tech)** Jan 2002
Indian Institute of Technology Bombay, Mumbai, India
Department of Civil Engineering, (Concentration: Transportation Systems Engineering)
Thesis: Capacity Analysis of Signalized Intersections in Developing Countries
- **Bachelor of Engineering (B.E.)** Jul 1998
Karnataka University, Dharwad, India
Civil Engineering Department
Thesis: Concrete Mix Design using Artificial Neural Networks

PUBLICATIONS

• Journal Publications

1. Patil, G. R., Ukkusuri, S. (2010). The sample average approximation technique for the flexible network design problem, *Journal of Computing in Civil Engineering*, In Press.

2. Ukkusuri, S, Ramadurai, G., and Patil, G. R., (2010). A robust transportation signal control problem accounting for traffic dynamics, *Computers and Operations Research*, Volume 37, Issue 5, pp 869-879.
3. Ukkusuri, S.V., Patil, G. R., (2009). Multi-period transportation network design under demand uncertainty, *Transportation Research Part B: Methodological*, 43 (6), pp. 625-642
4. Holguín-Veras, J., and Patil, G. R., (2008). A Multicommodity Integrated Freight Origin-destination Synthesis Model, *Networks and Spatial Economics*, 8(2-3), pp 309-326.
5. Patil, G. R., and Ukkusuri, S., (2007). System Optimal Stochastic Network Design Problem, *Transportation Research Record*, No.2029, pp 80-86.
6. Ukkusuri, S., and Patil, G. R., (2007). Exploring User Behavior in Online Network Equilibrium Problems, *Transportation Research Record*, No.2029, pp 31-38.
7. Holguín-Veras, J., and Patil, G. R., (2007). An Integrated Commodity Based / Empty Trip Freight Origin-Destination Synthesis Model, *Transportation Research Record*, No. 2008, pp 60-66.
8. Holguín-Veras, J., and Patil, G. R., (2005). Observed Trip Chain Behavior of Commercial Vehicles, *Transportation Research Record*, No.1906, pp. 74-80.
9. Patil, G. R., Aultman-Hall, L., and Holmen, B., (2010). Environmental Traffic Assignment: Developing emissions-based models, *Transportation Research Part A*, under review.

• **Refereed Conference Proceedings**

1. Patil, G. R., Patare, P., and Sangole, J., Gap acceptance behavior of two-wheelers at limited priority uncontrolled intersections, Accepted to be included in *proceedings (CD-ROM) of 90th Transportation Research Board Annual Meeting*, Washington D. C. January 2011.
2. Jaiswal, D. and Patil, G. R., Private Participation in Financing National Highways in India, *In proceedings of International Conference: Developments in Road Transportation (DRT - 2010)*, October 2010, Macmillan Publishers India Ltd., pp. 263- 270.
3. Sangole, J., Patil, G. R., and Patare, P., Modeling gap acceptance behavior of two-wheelers at uncontrolled intersections using Neuro-Fuzzy, *In proceedings of Conference on infrastructure, sustainable transportation and urban planning*, IISc Bangalore, India, October 2010.
4. Patil, G. R., Patare, P., and Sangole, J., Modeling Gap acceptance behavior of two-wheelers at limited priority uncontrolled intersections, *In proceedings of Conference on infrastructure, sustainable transportation and urban planning*, IISc Bangalore, India, October 2010.
5. Belz, N. P., Patil, G. R., and Aultman-Hall, L., Spatial Models for the Statewide Evaluation of Transit-Supportive Zones, *In proceedings (CD-ROM) of 89th Transportation Research Board Annual Meeting*, Washington D. C. January 2010
6. Patil, G. R. and Ukkusuri, S., The Sample Average Approximate Method for the Flexible Network Design Problem, *In proceedings (CD-ROM) of 87th Transportation Research Board Annual Meeting*, Washington D. C. January 2008.
7. Patil, G. R. and Ukkusuri, S., Modeling Flexibility in Transportation Network Design, *In proceedings (CD-ROM) of 86th Transportation Research Board Annual Meeting*, Washington D. C. January 2007.
8. Patil, G. R. and Ukkusuri, S., Stochastic System Optimal Network Design Problem, *In proceedings (CD-ROM) of 86th Transportation Research Board Annual Meeting*, Washington D. C. January 2007.
9. Patil, G. R., and Ukkusuri, S., Exploring User Behavior in Online Network Equilibrium Problems, *In proceedings (CD-ROM) of 86th Transportation Research Board Annual Meeting*, Washington D. C. January 2007.

10. Holguín-Veras, J., and Patil, G. R., An Integrated Commodity Based / Empty Trip Freight Origin-Destination Synthesis Model, In *proceedings (CD-ROM) of 86th Transportation Research Board Annual Meeting*, Washington D. C. January 2007.
11. Patil, G. R., Krishna Rao, K. V., and Xu, N., Modeling Saturation Flow at Signalized Intersection in Developing Countries, In *proceedings (CD-ROM) of 86th Transportation Research Board Annual Meeting*, Washington D. C. January 2007.
12. Holguín-Veras, J., Patil, G. R., An Integrated Commodity Based / Empty Trip Freight Origin-Destination Synthesis Model, In *proceedings (CD-ROM) of XIV Panamerican Conference of Traffic and Transportation Engineering*, Gran Canaria, Spain, 2006.
13. Ukkusuri, S. and Patil, G. R., Exploring User Behavior in Online Network Equilibrium Problems, In *proceedings (CD-ROM) of 11th International Conference on Travel Behaviour Research (IATBR 2006)*, Kyoto, Japan, August 2006.
14. Holguín-Veras, J., and Patil G. R., Observed Trip Chain Behavior of Commercial Vehicles, In *proceedings (CD-ROM) of 84th Transportation Research Board Annual Meeting*, Washington D. C. January 2005.
15. Patil, G. R., and Holguín-Veras, J., Observed Trip Chain Behavior of Commercial Vehicles, In *proceedings (CD-ROM) of XIII Panamerican Conference of Traffic and Transportation Engineering*, Albany, NY, September 2004.

• **Conference/Workshop Proceedings of Abstracts only**

1. *Real-time traffic counting and monitoring system* (National workshop on Intelligent Transportation Systems, Pune, June 2010)
2. *Flexible Network Design with Elastic Demand* (INFORMS Annual Meeting, Seattle, November 2007).
3. *Sample Average Approximation method for the Flexible Network Design* (INFORMS Annual Meeting, Seattle, November 2007).
4. *Flexibility in Transportation Network Design* (INFORMS Annual Meeting, Pittsburg, November 2006).
5. *Exploring User Behavior in Online Network Equilibrium Problems* (INFORMS Annual Meeting, Pittsburg, November 2006).
6. *Stochastic System Optimal Network Design Problem* (INFORMS Annual Meeting, Pittsburg, November 2006).
7. *Concrete Mix Design using Artificial Neural Networks* (National Level Student Symposium at Shanmugha College of Engineering, Tanjavur, India, 1998).

TEACHING EXPERIENCE

• **Courses Taught:**

Indian Institute of Technology Bombay

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|---|-------------|
| 1. Transportation Engineering I (UG -Minor, Sole instructor) | Autumn 2009 |
| 2. Transportation Engineering I (UG - Core, Primary Instructor) | Spring 2010 |
| | Spring 2011 |
| 3. Probability and Statistics in Civil Engineering (UG, Assistant instr.) | Spring 2010 |
| 4. Transportation Engineering II Lab (UG, Sole instructor) | Autumn 2010 |
| 5. Traffic Design and Studio (PG, Sole instructor) | Autumn 2010 |

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| 6. Urban Transportation Systems Planning (PG, Assistant instr.) | Autumn 2010 |
| University of Vermont | |
| 1. Traffic Demand Modeling (Grad, Sole instr.) | Spring 2009 |
| 2. Decision Analysis in Environmental & Transportation Systems (UG, Sole Instr.) | Fall 2008 |

• **Teaching Assistant:**

Rensselaer Polytechnic Institute, Troy, NY

Responsibilities include in-class teaching, preparing and grading home works and exams, meeting regularly with students, and guiding in field projects.

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| 1. Strength of Materials | Fall 2003 |
| 2. Highway Engineering | Spring 2004 |
| 3. Introduction to Transportation Engineering | Fall 2004 |
| 4. Civil Engineering Capstone Design | Spring 2005 |
| 5. Transportation Facility Design and Planning | Spring 2005 |
| 6. Civil Engineering Instrumentation & Sensors | Fall 2005 and Fall 2006 |
| 7. Traffic Control Systems | Spring 2007 |

INDUSTRY EXPERIENCE

- **Frischmann Prabhu (India) Pvt. Ltd. Mumbai, India** Apr 2002 – Jul 2003
Post: Transportation consultant
 Responsibilities include Planning, conducting, and analyzing various traffic surveys, Economic analysis of toll roads, and Consulting various government organizations and infrastructure projects funding agencies
- **Maharashtra State Road Development Corp. (MSRDC), India /Indian Institute of Technology Bombay, India** Jul 1999 – Dec 2001
Post: Research Assistant

SPONSORED PROJECTS

- **Principal Investigator**
 1. Modelling traffic flow and driver behaviour at uncontrolled road intersections.
Agency: Department of Science & Technology (Fast-Track Scheme for Young Scientist)
Duration: Oct 2010 to Oct 2013
 2. Virtual Lab for Urban Transportation System Planning
Agency: Ministry of Human Resource Development
Duration: July 2009 to July 2011
Co-PI: Prof. Tom V. Mathew
 3. System level traffic accident analysis and developing GIS based Decision support for Mumbai city
Agency: IRCC, IIT Bombay
Duration: Feb 2010 to Feb 2012
 4. National Program on Technology Enhanced Learning (NPTEL)
Agency: Ministry of Human Resource Development
Duration: Feb 2010 to Feb 2012

- **Co-PI**

Real-Time Traffic Counting and Monitoring System

Agency: Department of Information Technology and CDAC

Duration: Oct 2009 to Oct 2012

PI: Prof. Tom V. Mathew

Other Co-PIs: Prof K. V. K Rao, Prof. S. Choudhari, and Prof. Harish Pillai

CONSULTANCY PROJECTS

- **Co-PI**

- Transportation Planning for Solid Waste management in Mumbai Metropolitan Region

Agency: NEERI, Mumbai and MMRDA

Duration: Running since Sept 2009

PI: Prof. S. L. Dhingra

- Traffic impact and internal TRAFFIC planning for VCP-2 247 Park HCC

Agency: HCC Ltd

Duration: Running since Aug 2010

PI: Prof. Tom V. Mathew

GRADUATE THESIS SUPERVISION

- **Ph.D**

Jayant Sangole

July 2009 to date

Thesis: Modeling traffic flow at uncontrolled intersections

Prashant Sahu

January 2010 to date

Thesis: TBD

- **M. Tech.**

Prasad Patare

April 2010 to May 2011

Thesis: Developing Behavioral models for analyzing uncontrolled intersections

Digvijay Pawar

April 2010 to May 2012

Thesis: System level traffic accident analysis and developing GIS based Decision support for Mumbai city

Anuj Kumar Yadav

April 2010 to May 2012

Thesis: Analysis of freight transportation in Mumbai region

B. TECH THESIS SUPERVISION

- **Current (Year 2010-2011)**

Kanchana Nanduri

Thesis: Developing simulation model for IIT Bombay campus road network using VISSIM

Ankita Choudhari

Thesis: Traffic simulator for unsignalized intersection

Vijapal Bishnoi

Thesis: After construction economic evaluation of Mumbai-Pune expressway

Kritin Joshi

Thesis: Developing Tool for capacity analysis of signalized intersection

Raunak Jain

Thesis: Trip generation models for Indian cities

Aaron D'Souza

Thesis: Developing tool for statistical analysis

Priyank Rajpurohit

Thesis: Performance of different control strategies under various demand levels

Ashish Sharma

Thesis: Evaluation of public transit system using LITRES-II

- **Past**

Avi Khivasara

(2009-10)

Thesis: Transport infrastructure for regional solid waste management in Mumbai Metropolitan Region (MMR)

Gnyanendra Kumar

(2009-10)

Thesis: Tailpipe emissions modeling for vehicles in India

Bhavik Garg

(2009-10)

Thesis: Transportation System of IIT Bombay Campus

INVITED TALKS

- *Using a Regional Microscopic Simulation Model to Evaluate Potential Work Zones Control Strategies* Institute of Transportation Engineers, Vermont, June 2008
- *Stochasticity and Flexibility in Transportation Network Design*, College of Engineering, University of Vermont, Nov 2008
- *Transportation Network Design Problem*, QIP short term course, IIT Bombay, July 2010
- *Real-time Traffic Counting and Monitoring System*, QIP short term course, IIT Bombay, July 2010

HONOURS AND AWARDS

- Recipient of “Best Project Award in Transportation Engineering” from IIT Bombay for the year 2002.
- Awarded First Prize in National student paper presentation symposium organized by Shanmugha College of Engineering, Tanjavur, India, 1998.
- Secured First position in class in final year of Bachelor degree, 1998.

PROFESSIONAL ACTIVITIES

- **Organizing Conferences/workshops**
 - Coordinator, *9th International Workshop on Transportation Planning and Implementation Methodologies in Developing Countries (TMPDC)*, Mumbai, India, Dec 15-17, 2010
 - Assistant Coordinator, *XIII Panamerican Conference on Traffic and Transportation Engineering*, Albany, NY, Sept 26-29, 2004

- Member of organizing committee, *4th International Workshop on Transportation Planning and Implementation Methodologies in Developing Countries (TMPDC)*, Mumbai, India, Dec 5-7, 2000
- **Current Administrative Responsibilities**
 - Member of the Traffic and Transportation Committee, IIT Bombay
 - Faculty adviser of B. Tech 2009 batch of Civil Engineering
 - Member of the Ambience improvement committee, Dept of Civil Engineering, IIT Bombay
- **Journals Refereed**
 - Transportation Research Record (TRR)
 - Networks and Spatial Economics (NETS)
 - Transportmetrica
 - Journal of Advanced Transportation
- **Conferences Refereed**
 - Transportation Research Board (TRB) Annual Meeting
 - Panamerican Conference on Traffic and Transportation Engineering
 - Conference on infrastructure, Sustainable Transportation and Urban Planning
- **Membership**
 - Transportation Research Board (TRB)
- **Other Activities**
 - Administrator of transportation system engineering studio lab and hostel (dormitory) computer facilities at IIT Bombay, 2000-2001
 - Member of hostel (dormitory) governing council during masters at IIT Bombay, 2000-2001
 - Class representative during the fourth year of undergraduate study, 1997-1998

COMMUNITY WORK

- President of Association of India's Development (AID), Troy, New York Chapter 2006-2007. (AID is a four star rated—the maximum rating by the US Charity Navigator—charity organization).
- Volunteered to teach adult illiterates during the literacy movement initiated by the Government of India in 1997.
- Overall coordinator of the annual AID fundraising luncheon organized on Oct 28, 2006 in Troy, NY.
- Mentored and taught Mathematics to primary and high school students on weekends and vacations during my undergraduate years.

COURSE WORK

Rensselaer Polytechnic Institute

Critical Issues in Transportation Engineering, Transportation System Modeling, Applied Regression Analysis, Transportation Demand Modeling, Applied Multivariate Analysis, Queuing Systems and Applications, Transportation Economics, Intelligent Transportation Systems, Math Models of Operation Research, Mathematical Statistics, Dynamic Transportation Modeling

Indian Institute of Technology Bombay

Design Models in Management, Applied Statistics, Traffic Engineering, Urban Transportation System Planning, Materials, Design & Construction of Pavements, Regional and Rural Transportation Systems Planning, Economics and Evaluation of Transportation projects, Modern Information System