

SAMPLE

Faculty Development Plan

Civil and Environmental Engineering

A Self-Assessment

I am a naturally curious individual who is readily able to identify problems and potential solutions to them. I am also eager to serve and volunteer my expertise and time to solve problems that people in my community face. My principal research interest is in long-term transport demand modeling and forecasting, and in particular how modern third-party "Big Data" products can help in this process. As a faculty member I feel a need to more effectively organize my time to complete complex, long-term projects without consistent engagement; I can be distracted by the problems I face today at the expense of problems I will face in the future. My masters degree in applied econometrics has given me useful statistical and modeling background, but this has also led to my participation on projects where my primary contribution is methodological. I want to ensure in my early work as a faculty researcher that there is a coherent thesis and concept beyond the methods I employ. I also feel a need to engage in adventure and exploration in my professional and extracurricular life. I hope to come closer to my Heavenly Father by helping my students discover the blessings that result from effective and comprehensive transportation systems.

B Professional Goals

B.1 Teaching

I want to be a useful teaching member in the department, teaching both undergraduate courses taken by all students early in their major (CEEn 201), technical core classes (CEEn 361), and advanced transportation planning courses (CEEn 565). Beginning in my third semester I plan to teach a complete course load.

Student Ratings I will maintain average student ratings of at least 4.4 in all my courses in each semester; if

the average rating is less than 4.4, I will document concrete steps to improve the course. Regardless of the average student rating, I will document my attempts to address any constructive negative feedback I received.

SCOT Engage the Students Consulting on Teaching program each semester for each course I teach. I will document the report and any resulting efforts to improve the course or its presentation.

Mentoring I will admit on average two MS students each academic year and see them through to graduation. I will engage undergraduate students early, and will mentor at least two undergraduates in a culminating research project (Honors Thesis or similar) before my fifth year.

ASCE EXCEED I will apply for the 2020 EXCEED Teaching Workshop. If not selected in 2020, I will reapply each subsequent year.

B.2 Scholarship

My scholarly work to this point has focused on finding ways to integrate passive data products — defined as data collected for a purpose other than transportation planning including cellular phone and GPS records, household marketing datasets, etc. — into regional travel demand models. I have used a number of methods in these investigations, including spatial econometrics, discrete choice analysis, and data-driven microsimulation. There are two overlapping research trajectories I intend to pursue early in my career:

1. The log-sum term of a destination choice model is a powerful measure of multi-modal accessibility, but researchers and practitioners alike continue to use less comprehensive but more readily available measures. What happens when we replace these available measures in accessibility analyses? This is the topic of a manuscript currently under review as well as an upcoming project funded by the Utah Department of Transportation.
2. Travel demand microsimulation is an important tool for analyzing potential responses to novel transportation policies, but generating synthetic daily activity patterns for such simulations is a difficult problem. It is also a problem that can be informed with passive data and data-driven simulation methods. This was the primary challenge I was focused on in my startup company, and an upcoming project funded by UDOT gives me a chance to explore some of this.

The overlap comes in that present data-driven models do not tend to see accessibility very well, sending people to destinations they are unlikely to use. Moreover, classical trip distribution models are often the least accurate elements of a travel demand model. My research direction for the next few years will be to investigate data-driven approaches to trip distribution in the context of accessibility analysis and daily activity pattern simulation.

Journal Articles I will submit two articles to top-tier journals each year, and potentially one to a mid-tier journal.

TRB I will prepare a submission each year for the TRB annual meeting and either the TRB Planning Applications or TRB Innovations in Travel Modeling conferences, which are held in alternating years.

Other Conferences I will submit to and attend at least one non-TRB conference each year in an effort to expand my network. This may be an international academic conference or a regional professional organization conference.

National Science Foundation Identify an NSF CAREER proposal topic in 2019 and prepare a submission in 2020. By my sixth year, lead one major proposal and be a co-investigator on at least one more.

Utah Department of Transportation Prepare at least two UTRAC research problem statements each year. Collaborate with Grant Schultz on at least one other each year. I will help my students present at the UDOT annual conference each year.

USDOT University Transportation Centers By my third year, identify partners for a regional UTC proposal. By my sixth year identify partners and participate on a national UTC proposal.

College In my second year, lead a mentoring research grants proposal to actively engage undergraduates in transportation planning research.

B.3 Citizenship

External I am currently on TRB's Young Members Council and am the co-chair of the YMC's Planning and Environment Subcommittee. I will serve in this capacity for three more years. I am also beginning a three-year term on TRB Standing Committee ADB50: Travel Forecasting Resources which I am eligible to renew. By my sixth year I plan to serve on the executive planning committee of the bi-annual Innovations in Travel Modeling conference.

Internal I will actively participate on at least one department, college, or university committee each year. By my sixth year, I hope to be the department's Honors Coordinator and help encourage undergraduates to approach interdisciplinary problem-solving.

Community I will participate in one ITE/AREMA service project each year. I will begin attending Provo and Springville city planning meetings and provide aid in some informal capacity by my fifth academic year.

C Relationship between Personal Goals and University Aspirations

Civil and Environmental Engineering is seeking to elevate the level of scholarly activity within our department as we seek to fulfill our mission of developing world-class engineers who are committed to the Gospel of Jesus Christ; my personal publication and funding goals will contribute to this department goal. In general, achieving my goals will place me at or ahead of the university, college, and department rank and status categories and guidelines.

D Activities and Accomplishments in Achieving Goals

I attempt to keep my *curriculum vitae* up-to-date with my activities and accomplishments; interested readers can find this on my homepage at <https://gregmacfarlane.netlify.com/files/cv.pdf>. Beyond this I will add a few recent achievements:

Teaching I completed the first semester of teaching CEEEn 662 and received above-average student evaluations. I have used this experience to rewrite the course with a new textbook and outline.

Scholarship I received two small grants from the Utah Department of Transportation and am finalizing negotiations on third, totaling \$125,000. These grants will fund two MS students and two to three undergraduate researchers. I have also been invited to present my work in panel sessions at two conferences this summer.

E Optional Comments on Measures Used to Assess Success

I currently serve on my department's Faculty Development committee; the experience has been valuable in showing me what the other members of the department are doing. I am additionally grateful that the department has set clear definitions of what qualifies as excellent involvement in teaching, scholarship, and citizenship.