Heather Purdy (‘03)

When I graduated from Carleton in 2003, I had no idea what I wanted to do. The only thing I knew for sure was that I did not want to go to graduate school, because, for me, graduate school meant getting a PhD in mathematics and becoming a professor. At least that was what all of the other math majors who were going to graduate school were doing. Having just suffered through comps, I never wanted to see another math textbook or do another proof.

Math had always been a struggle for me— a satisfying struggle where the goal was just out of reach and if I pushed hard enough I could usually get a fingerhold. But it never came easy, especially at Carleton, and after four years, I was exhausted and couldn’t bear the thought of devoting any more time to math.

So, I went home, without a job and without a plan, to two very supportive and understanding parents. They helped me see, after an aimless summer that stretched into fall, that I needed to do something. I was still adamant about graduate school, but they encouraged me to take the GRE anyway while I had the time to study and school was still fresh in my mind. In October, I took the GRE and by early December I had stumbled across a graduate program at Northwestern University in Transportation Planning. I put together my whole application, including recommendations, in two weeks (Thanks Steve!) and waited until March to find out I was accepted.

Although I had not been consciously working toward the field, I discovered that many of my classes and interests fit well in transportation planning. My favorite math classes had been graph theory, combinatorics, and geometry because I love picturing networks (especially roads). Transportation planning looks at using and creating transportation infrastructure to serve communities. This involves understanding: the historical context of a place, the economics of large infrastructure investments, why people choose to walk, drive or take the bus, etc. As a good Carleton student, I took and loved classes in all of these areas and was excited to combine them with math to get a job. I also remembered a math major, a senior my freshman year, who went into transportation planning. I tracked her down and was encouraged that she was still excited about the field too.

I graduated with a Master’s degree and moved out to Seattle to do travel demand forecasting. When new roads or transit systems need to be built, replaced or upgraded, certain laws require that various alternatives be considered and decision makers prefer numbers (number of people served, hours of congestion, etc.) to compare the different options. Travel demand forecasting provides these numbers by developing and applying mathematical models (based on land use predictions, assumptions about how people make trips and basic characteristic of the street network) to forecast the impact of a new infrastructure investment. I was fortunate enough to work on some of the biggest transportation projects in the area and soon discovered that big usually means controversial and expensive. That is a recipe for a slow and deliberative process, so after three years, I decided I was ready to try something else.

I felt almost as lost as I did when I graduated, except this time I knew a little bit more about myself. I loved not owning a car and the other ways it was easy to be green in

Seattle, I didn’t want to move, and infrastructure is a great way to make a big impact. Not driving a car can make a difference, but helping to make the roads safer for bikes and pedestrians will encourage others do it too. Being more energy efficient is important, but if you are still burning coal for your electricity, there is room for improvement. So, inspired by the wind turbine I saw on campus when I came back for my 5-year reunion, I started working for a wind energy consulting company in Seattle.

For the last two years, I have worked as a wind energy analyst, estimating energy production for wind farms throughout North America and the world. Before a wind farm is built, the bank wants to know how much electricity it will produce over the life of the project so they can be sure the wind farm can pay back the loans. But, the wind can be unpredictable, so we use on-site measurements and statistical methods to give a best estimate and a distribution of annual energy production. It is exciting and worthwhile work and I never would have guessed it was a job I could do as a math major.

Being a math major has given me many skills including a familiarity and comfort with quantitative problem solving. The two most important skills though are: the ability to see the big picture and the willingness to persevere through the details. When you do a proof, you have to know where you are going (big picture) and you have to be careful that each step leads you there (the details). These are critical no matter what problem you’re trying to solve.

My advice to current math majors, especially those that don’t want to be math professors, is to think of math not as a job but as a toolkit. Then think about what questions fascinate you, what problems annoy you and what you find yourself doing even when you don’t have to. I can almost guarantee you that these issues are flooded with data and need someone who can make sense of it. This is what you can do with a math major! Sometimes you will use the equations in your toolkit, but more often you will use the methodical and detail-oriented approach to problem solving you are honing in every math class. And if you don’t know what topics interest you, take lots of different classes, attend guest lectures, study abroad, ask others what fascinates them and generally keep your eyes open. Carleton is an amazing place to encounter ideas and you’ll be amazed how often you come back to your Carleton experiences for inspiration and guidance.

Oh, and take a statistics class. A real-life, honest-to-goodness, Carleton-level real statistics class. I didn’t and now I wish I had. It is the one college-level area of math I use on a regular basis (sorry, there are very few opportunities for non-Euclidean geometry) and I wish I had the strong background that only a Carleton math class gives you.