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American Infrastructure 2018

For a long time, America's infrastructure—the collection of public institutions that hold society together—has been failing. According to the [Infrastructure Report Card](#), America had a barely passing infrastructure, one that earned the grade D+, in both 2013 and 2017. So while America showed no decline in grade over the last four years, its grade also reflects the frustrating fact that improvement relies on the cooperation of many.

Unfortunately, a D+ is not, in the scheme of things, that different from an F; what's worse, the young among us, the infamous millennials, are soon to be the ones responsible for this less than perfect system. There are plenty of bright, conscientious people in this group, but no age group is homogeneous. Looking ahead and using today's politics as an example, we can predict that the difficulties posed by strengthening our infrastructure will be major and will be one source of political disagreement. While few are likely to oppose the theory of reforming the infrastructure, people are known to shy away from the major expenses that have low "bang for the buck," so to speak. Repairing a broken society is expensive and has few immediate effects. As a result, our immediate goal should be academic: We must create a feasible and attractive repair plan, and we must spread the word, both of our situation and our plan, to convince throngs of young, influential citizens to support improvement.

Successfully solving this challenge will require knowledge from a variety of disciplines. For the engineer, the fields involved in this task will include such fields as civil engineering, architectural engineering, structural engineering, wastewater engineering, hazardous waste engineering, mechanical engineering and to some degree electrical engineering. The broadest of these categories, the field of civil engineering, represents one of the two main categories of engineer needed to maintain our infrastructure: development of systems and development

of technologies. The first category involves the maintenance of public structures—such as dams, roads, and bridges that would fall under the jurisdiction of architectural or structural engineering. In a similar vein, waste (wastewater and hazardous waste) engineers deal with public structures, in this case, structures that collect and transport waste. In the second category—development of technologies—would be the fields of mechanical and electrical engineering, important in the improvement of machinery such as the buses, trains, and airplanes hundreds of citizens ride every day. We will require additional knowledge from fields involved in planning systems to make institutions such as airports and transportation systems as efficient as possible.

So now, it is time to answer the question we must all ask when making complaints: What am I actually doing about this problem? Personally, I have little interest or skill in most of these fields. I don't have an innate sense of how to design structures and have difficulty planning and understanding complex systems. However, I do have an interest in electrical engineering, which I attribute in part to my experience with computers and in part to the game Minecraft. A sandbox game, Minecraft allows players to build anything they want but also includes a substance called redstone that acts as a wire to carry electrical signals. Because of the ease of building in Minecraft, I have developed an interest and understanding of the use of electricity to make systems to perform complex actions; this interest is of course furthered by my computer experience which reinforces my understanding of how two options—on and off—can represent large numbers of possibilities. At my age right now, I have not yet chosen a specific field of study; I am still broadening my horizons and have interests in computer science and mathematics as well. However, electrical engineering would give me the opportunity to make a contribution to the endless struggle of maintaining and improving our infrastructure.