Welcome to this audiovisual presentation on self-driving cars.

During the 1939 New York City World Fair, General Motors presented an exhibit designed by Norman Bel Geddes that showcased a vision for how highways could be created to control vehicular movements across the American landscape. The vision touted a route to practical application of sound principles of highway design that would take 20 years to achieve. Over 75 years later, we have yet to realize the vision of autonomous cars. But it’s starting to look like car manufacturers are seriously considering how to automate much of the driving experience.

One of the earliest steps toward automated driving was the invention of what we now call cruise control. Cruise control measured the rotations of the drive shaft that turns the wheels of a car and uses a solenoid to maintain this rate of rotation. As the rotation of the solenoid slows down, the current in a solenoid is altered, which signals the throttle to increase the car’s speed.

In the past 20 years, vehicles allow the driver to hand over more of the control of operating the car to the onboard computer. Many luxury vehicle manufacturers now include lane-keeping technology to prevent lane-departure while driving, automated cruise control adjustment based on the motions of vehicles ahead, rapid deceleration to prevent collisions with vehicles or obstacles in the path, and automatic parallel parking. In the future, look for added functionality including speed-limit indicators based on highway speed limit signs, pedestrian and cyclist collision warnings, and automatic high-beam switching based on oncoming traffic.

Google is reportedly testing its version of the automated car on highways in states where it is legal to do so. Only a handful of states permit these cars to operate autonomously. The cars are not infallible. There have been two instances where the automated vehicles were involved with incidents. The first was a collision when the human operator was in control of the car, and the second was a rear-end collision when the Google car was parked at a stoplight. In both cases, humans were the causes of the accidents, not the car’s programming.

Multiple car manufacturers have publically stated predictions of when their company would offer automated vehicles. Take these with a grain of salt—remember, GM sponsored the 1939 World Fair exhibit.

The laws governing transportation are not ready for autonomous vehicles and the technology is outpacing legislative initiative to update these laws. Perhaps one of the main concerns about autonomous vehicle control is liability. If an accident between two autonomous vehicles occurs, which vehicle is at fault and is the human occupant at fault if the software is to blame? If the accident leads to a suit seeking damages, do you sue the software company or the occupant? Most of the technologies for autonomous vehicles include networked computers over cellular data connections, which would require a heightened level of security to prevent hacking and control of the vehicle by an unauthorized individual. There are also concerns about the visibility of lane debris or potholes and the effects of road conditions due to snow or rain on the performance of the computer to control the vehicle.

So, would autonomous cars fit our definition of intelligence? Perhaps not yet, but in the near future the software programming will exist to recognize unforeseen obstacles and execute countermeasures to avoid collisions with road debris, pedestrians, or other vehicles in the most frequent weather conditions. Imagine the opportunity for those vulnerable populations for whom operating a car is not allowed, including the blind, older adults suffering from debilitating diseases, and intoxicated adults. In order for the cars to become mainstream, their safety record for vehicle control would need to be better than human control and would need to react to unforeseen obstacles and events to protect the lives of the passengers.