Eisenhower - Celebrating the Father of Interstate Highways

Two hundred years ago, the city of Eisenhower had severe transportation problems: congestion, accidents, and construction. Located in North Texas, Eisenhower’s traffic initially flowed smoothly. By 2216, the population had swelled to 1,653,482. As motorists desired to drive different places, countless decision paths were possible. Sirens filled the air due to increases in traffic and accidents generating stressed, unhappy citizens. Disruptive road construction escalated as Eisenhower built roads on limited space resulting in tighter driving lanes. Cars crawling in traffic caused excessive air pollution, and weary commuters abandoned leisure activities. Research showed citizens squandered 47 hours sitting in traffic annually. Surveys and town hall meetings revealed a new transportation solution was needed. With longer commute times, citizens leaving Eisenhower, lower city revenue, fewer services, and higher taxes, engineers rose to the challenge and developed a three-tiered solution making safety their highest concern.

Today, solar roads, an intelligent highway system, establish safer roads while powering Eisenhower and have become the infrastructure for the transportation panacea. Developed by electrical engineers, roads consist of four layers:
• **Surface Layer** - translucent, high-strength glass protects the other layers

• **Subsurface Layer** - houses LED lights and heating elements

• **Electronic Layer** - holds the energy collecting solar panel and holds the microprocessor board that controls the load sensor, lighting, communication monitoring, and heating elements

• **Base Layer** - distributes power, supplies data signals, and protects the electronics

Lane stripes can be reconfigured to reroute traffic when accidents or congestion occurs.

The road’s glass has better traction than asphalt or concrete and heats to melt snow and ice.

Roads illuminate and provide drivers warning messages of problems ahead like if traffic is stopped, slowed, or unidentified objects are detected. Panels constantly communicate with one another to detect malfunctions or reroute drivers by sending signals to the city’s GPS.
Constant construction was a major quandary in Eisenhower. Now, repairs are expeditious requiring only fifteen minutes, one person, and two bolts. Because roads are durable, generally needing single panel repair only, construction has diminished. Solar roads were modeled for projected commuters and can be reconfigured for higher demand.

Next, the Solvoche, meaning “solar flying car”, is an automated vehicle that drives, flies, and combats congestion. It is intricately designed yet simple to operate. Aerospace engineers helped Solvoches reach for the sky when inventing the hideaway, blended wings which reduce noise by 95%. Mechanical and electrical engineers worked to make engines receptive to power emitted by solar roads. Nanotechnology helped material engineers improve carbon fiber, a durable but lightweight material, to be cheaper, lighter, and easier to manufacture.
Engineers recommended “rules of the air.” Solvoches are only permitted to fly directly above solar roads. Neighborhood flying is limited to emergency vehicles. Three levels of traveling space are available, each a different cost: roadways, the lower airspace, and the uppermost, automated level. Twenty-third century highways, flyways, disperse traffic with three times more travel area. If there is congestion on the road, flypasses allow Solvoches to quickly flyover.

Finally, Nanotechnology for Positioning, Navigation, and Timing, the linking piece between roads and vehicles, is Eisenhower’s advanced, voice-activated GPS system. NPNT eliminates chaos by sending communication signals between roads and vehicles. Geotraffic and software engineers utilized nanochips in vehicles, solar roads, and a supercomputer with predictive analytics to create NPNT, which economically routes Solvoches to their destinations. Nanochips are accurate to three inches and sense movement and direction. They alert Solvoches or emergency crews to occasional issues, letting automation take over and eliminating human error.
NPNT minimizes impact on other commuting vehicles and provides warning messages. Predicative analytics automatically adjust traffic flow in real time for maximum efficiency. Vehicles no longer stop at intersections because they utilize Dedicated Short Range Communication. Inspired by ants, DSRC uses swarm intelligence, processes travel paths, and routes drivers through intersections. NPNTs link cars traveling the same direction in a locking train formation and travel at accelerated speeds.

Previous GPS screens were a major distraction, moving drivers’ eyes off the road. Engineers solved this complication by devising the revolutionary NPNT windshield, making navigational images appear like they are on the road.

Geotraffic and electrical engineers worked synergistically so solar roads, Solvoches, and NPNTs would be compatible. They designed, tested, and integrated solar roads, enabled power transference from roads to Solvoches, and enabled NPNT’s real time communication.
Engineers evaluated the solutions’ risks using risk management. Eisenhower has steady power because deep cycle batteries collect and store excess power when the sun shines. Ground casualties are prevented because Solvoches takeoff and land vertically in designated areas of the city called flyportals. Furthermore, flying is not permitted in residential areas. In case NPNT fails, Solvoches notify drivers that flying has been eliminated until further notice and to land in the nearest flyportal. Drivers are protected, too. Multiple backup generators prevent engine malfunction. If all else fails, a parachute safely carries the Solvoche down. NPNT malfunctions are lowered because nanochip redundancy is built into the vehicles and roads.

Engineers worked to make the three-tiered solution sustainable. Solar roads made fossil fuels obsolete; therefore, air pollution is reduced. Stormwater is drained through minuscule holes in solar roads and channeled through filtering pipes to minimize water pollution. The Solvoche’s wing design diminishes noise pollution. Additionally, schools sustain knowledge through hands-on engineering programs, and college grants enable continued technological developments.

These solutions were expensive to implement, but the tradeoffs provide many benefits and save Eisenhower money. Free energy from solar roads provides power and the surplus is sold to neighboring cities providing revenue. Roads and vehicles have better durability due to fewer accidents, allowing them to last longer with fewer repairs. These solutions are more cost effective than constant road expansion, and skeptical citizens have bought in entirely and enjoy the many benefits.
Just as President Eisenhower’s Interstate Highway Program transformed America, these solutions transformed Eisenhower into a beacon for others. Now, Eisenhower prides itself as a congestion-free city with a green transportation rating.
Works Cited


