Let’s drive the future.
Ray C. Anderson  (1934-2011)
Interface, Inc.

• Pioneered business case for corporate sustainability
• Brought industrial ecology to the mainstream
• “America’s Green Industrialist”
Road to “The Ray”
Ray C. Anderson Memorial Highway

- GA-AL state line → Exit 18 on Interstate 85
- Designated April 2014
- Includes I-85 Visitor Information Center
- Troup County, City of LaGrange, City of West Point
"The Ray" Goals, Mission

Better outcomes for communities, the economy & the environment.

Zero deaths
Zero carbon
Zero waste
Liabilities → Assets
Leverage more value
• First public PV4EV in the Southeast

• Important EV charging infrastructure – connects Atlanta & Montgomery

• 8 MWh generated
  6 tons CO2 avoided
Wattway on The Ray

- World’s first DRIVABLE solar road surface
- Pilot on The Ray is 1st in world outside of France
- Minimum 10 yr. durability, all-weather, rain-proof
- Exceeds state average for road surface safety (.98 friction number = 70 skid number)
- 3.5 MWh generated
Unlocking the value in the Road

Generating energy
Solar in the Right-Of-Way

- 1MW ROW solar pilot – online Q3 2018
- Approx. 3,000 panels on 5 acres → 170 homes
- Georgia Power self-build = power to grid
- Pilot on The Ray will be 5th in U.S., 1st in GA
- Pollinator-friendly solar pilot
Turfgrass
Maximum root depth 3-6 inches

Native Grasses & Forbs
Common root depth 4-6 feet

Solar Site Management for Soil, Storm Water, and Pollinator Benefits
Goal: Zero deaths on The Ray

• 20% increase in U.S. road fatalities since 2011
• Over 40,000 people killed on U.S. roads in 2016 – most in 10 years
• Number of road fatalities as % of miles driven is also increasing
• “everyone else’s problem” … $100’s of millions spent to reduce distracted driving, impaired driving, speeding & tailgating
WheelRight tire safety station

- Measures tread depth & tire pressure within seconds - automatic, drive-through
- In U.S., under-inflated tires waste 2B gal. fuel/yr. & increase tail pipe emissions
- WheelRight (UK) pilot on The Ray 1st in U.S. – only tread depth monitoring in the world
Value proposition:

BLIP can impact 89% of U.S. road deaths

(1) Lane visibility
(2) Smart road that collects data digitally
(3) ... that communicates data digitally
(4) ... that communicates through color to “classic” cars
The BLIP Components

**TOP COVER + LENS**
A top polycarbonate casing focuses the sunlight onto the solar panel to maximise energy capture, while two lens patches help optimise the LED light cones for maximum visibility.

**LED + RETROREFLECTOR**
Red, green and blue LEDs combine to enable multiple colours. The LEDs are backed on an aluminium base for heat dissipation. The retroreflector ensures lane delineation (redundancy) should the system fail.

**SOLAR PANEL**
Approximately 100cm² surface area of solar panel is required to generate sufficient power for day and night functionality.

**INVERTED-F ANTENNA**
For DASH7 communication between stud and control box. Antenna is soldered to the circuit board.

**MAIN HOUSING**
Made from glass reinforced plastic.

**DASH 7, MAGNETOMETER + SENSORS CIRCUIT BOARD**

**BATTERY**
Approximate volume: 33cm³
**REQUIRED TECHNOLOGIES**

**SYSTEM OVERVIEW**

1. **ROAD STUDS**
   - Road studs are set 12-24m apart along all lane boundaries. Each stud detects a ‘blip’ when a vehicle passes at a particular point in time, and each ‘blip’ is then transmitted to a control box.

2. **CONTROL BOX**
   - Control boxes, repeated every mile along the side of the road, collect the ‘blips’ transmitted by the road studs within that section of road. The control boxes process a series of ‘blips’ to calculate vehicle position and speed. They can also communicate with the outside world and be programmed remotely using cellular communication.

3. **PREDICTIVE TRAFFIC MODEL**
   - With the control box gathering snapshots of vehicle speeds and positions, it is able to produce a traffic model that predicts movements of each vehicle on the road.

4. **SIGNAL**
   - The control box is programmed to recognize particular situations in the traffic model where a road stud should produce a signal - for example, if the control box recognizes a case of tailgating, it communicates to the appropriate road studs to change colour (e.g., to flash red).
Concepts for Future Consideration

- Integrated solar noise barriers
- Right-of-way wind generation
- Drone monitoring
- Sensor network for safety & sustainability
- Connected vehicle pilot
- Sustainable road materials
- Right-of-way farming
THE RAY

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