

Gravitational Systems Engineering.

We design and manufacture systems that generate energy and increase the efficiency of existing energy sources by concentrating gravitational potential energy or resistance, for commercial and industrial applications.

Our green energy systems, primarily pumps, compressors and safety deceleration systems [speed spongestm], operate with little or no conventional fuel while increasing the efficiency of conventional fuel usage by up to 100%.

GSE is the originator of many environmental energy designs, with patents and developmental generations of pumps, compressors and energy redirection appliances since 1998.

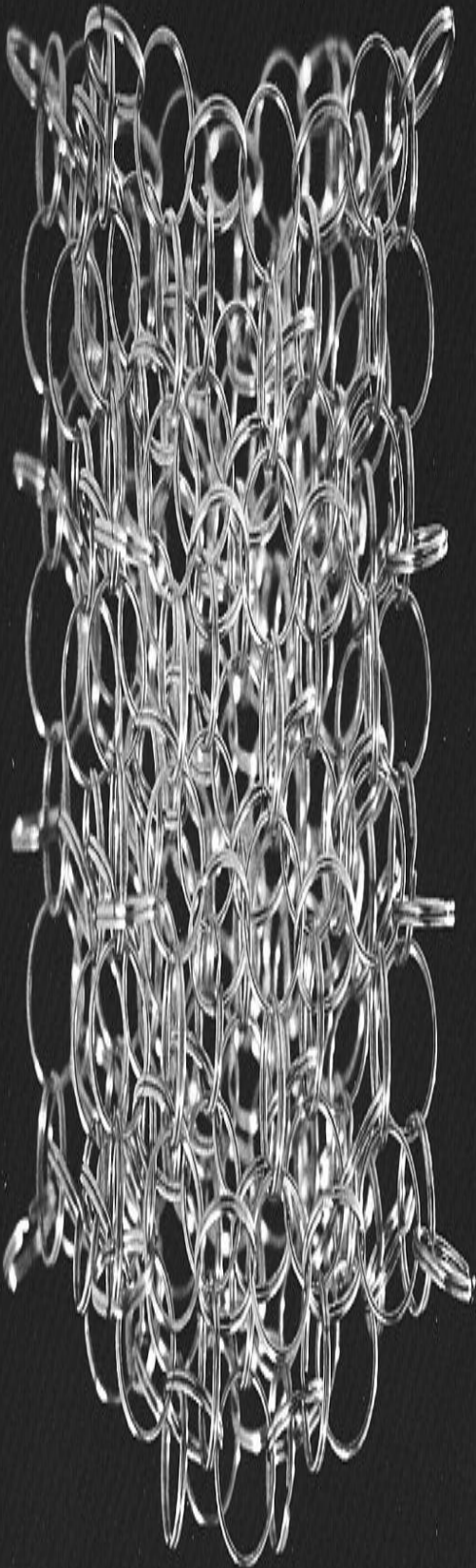
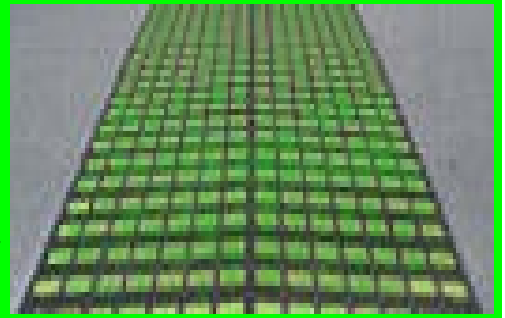
GSE specializes in environmental energy sources including; static gravity, direct gravitational phenomena (i.e. katabatic wind, hydrostatics, etc.), and relative, or entropic sources such as animated masses (i.e. fluid flows, vehicles, animals, pedestrians, etc).

R-Series Pumps & Compressors:

**GSE relative gravity
energy, systems
leverage energy**

**expended by animated masses. Animated
masses are entropic sources typically
absorbed, in the environment, as heat, or
roadway compression (as stress or wear).**

**The concept of gravity, or potential energy as a
power source seems revolutionary, but it is
already the source of roughly 20% of industrial
scale energy production, as hydro-electrics,
and related systems. GSE technologies are a
new application of DSE (dynamic state energy)
systems, which include wind, solar, and
hydroelectric.**



**Roadway
compression, a
primary rationale for
truck limits worldwide!
Each heavy truck
expends tremendous
energy directly into
the roadway and**

**underlying support structures. Studies show
that a car traveling at 45 mph, dissipates 15-20
watts of energy into the roadway each second.
While a large truck dissipates between 150-250
watts of energy into the roadway at the same
speed.**

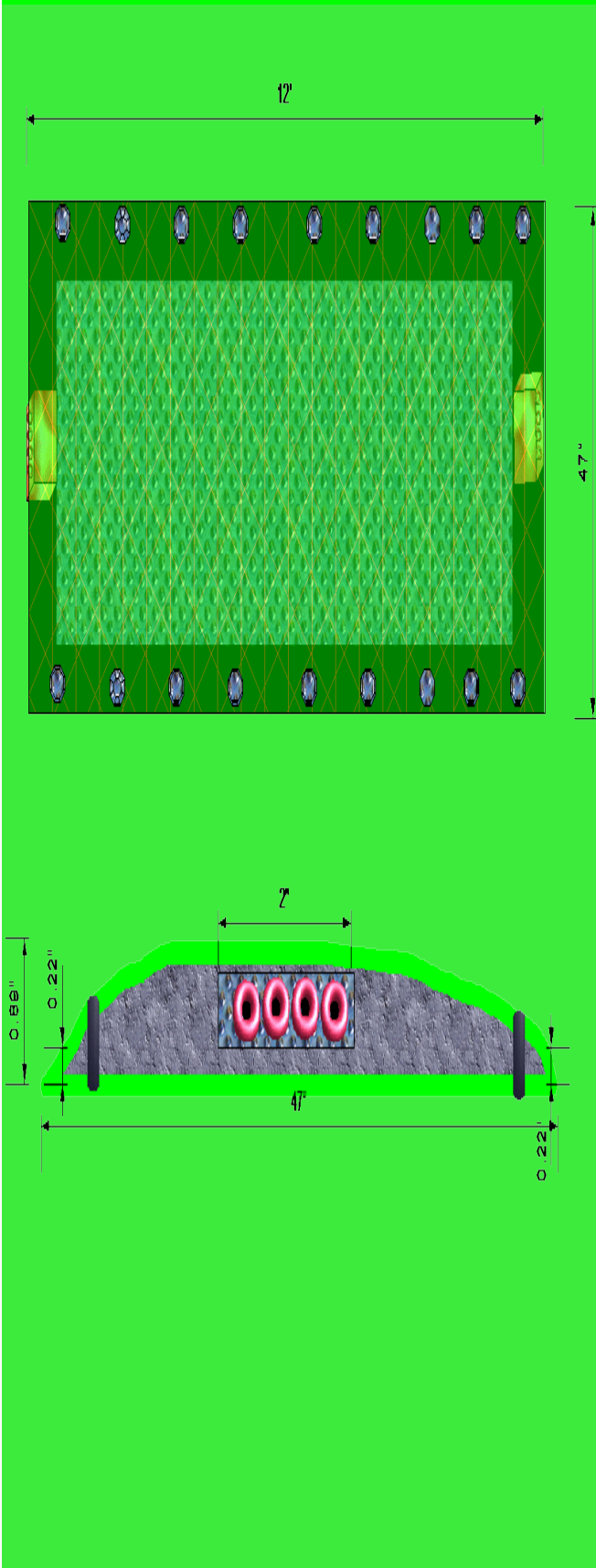
**GSE R-series systems, engineered for
pedestrians, livestock, motor traffic, trains,
aircraft transitions, and ships, convert roadway
compression [stress] into directed pressure or
fluid compression.**

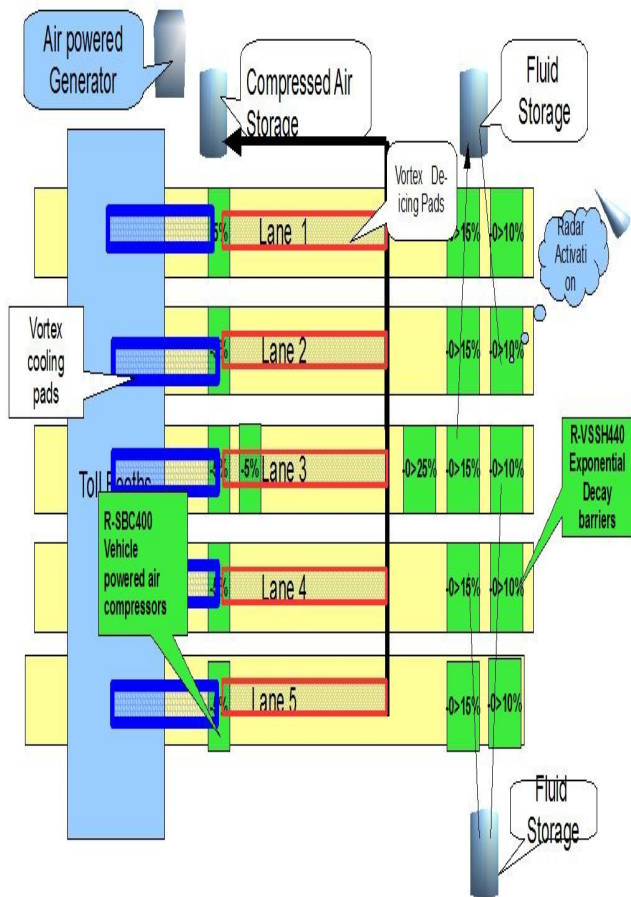
R-Series: Speed Sponges:

GSE speed sponges are based upon kinetic energy redirection. GSE R-series systems derive 95+% of their energy from the potential energy of a dynamic mass.

Dynamic masses compress/release roadway material causing energy to flow into the roadway, and dissipate across the entire horizontal expanse, and vertically into the supporting structures, (bridge, subsoil, etc.). It is the horizontal dissipation which is largely responsible for road wear, and the effects of vertical dissipation are evident as bridge stress.

A speed spongetm is a horizontally emplaced application that removes forward momentum, and therefore speed from a moving vehicle, or process. Speed spongestm are engineered to target specific speed/mass processes, up to or exceeding K-12, by implementing an exponential decay function. The device can be engineered to have a minimum impact on vehicles traveling below the targeted speed/mass, while having maximum impact on all other vehicles.





Unlike other speed absorption technologies based upon engineered materials, speed sponges tm are automatically reset to optimal as soon as the mass of the targeted vehicle, or process, passes over the device.



Speed sponges tm can be engineered within a wide variety of fixed, or operator controlled, capacities. These devices can be designed to operate effectively on vehicles ranging from bicycles to jumbo jets. Targetable vehicles include wheeled, tracked, and rail based vehicles.

A speed sponge tm redirects the energy from the targeted process into either gas compression or fluid pressure. Sufficient quantities of energy re-directed from the targeted vehicle to operate other ancillary systems such as pneumatic or hydraulic barriers, flame suppression, and diversion systems.

Speed sponges tm are constructed of durable, recycled materials and will provide many years of service even under high demands or inhospitable environmental conditions.

An above ground speed sponges tm, can be retrofitted to existing roadways, or used as a temporary device. Above ground speed sponges come in widths ranging from 2 to 6 feet, and can be configured to span road surfaces of almost any length.



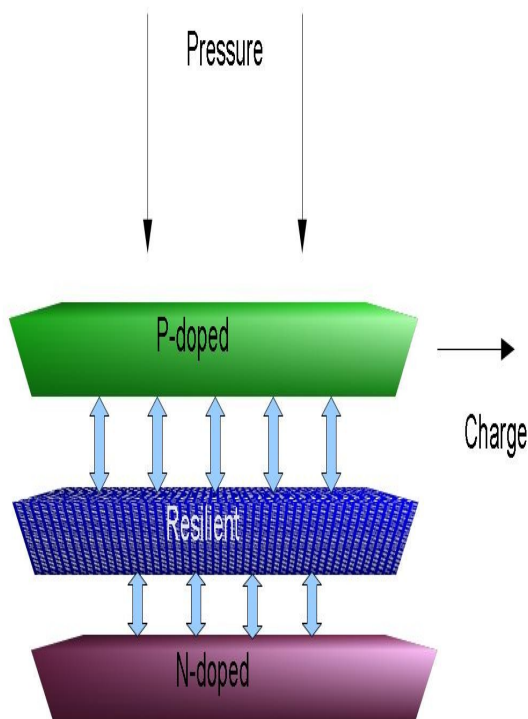
Embedded speed sponges tm are built into the roadway as either retrofit or new construction. Embedded speed sponges are custom designed and can be built to almost any width and length.

By implementing an exponential decay function, these devices have applications far beyond crash mitigation.

When implemented as a residential speed table vehicles below the targeted mass/velocity will barely notice its existence. This means that cars traveling below a selected speed will encounter the speed sponge tm as a high friction road surface. However, heavier or faster moving vehicles will experience the device with the resistance of 8 inch deep mud or wet sand.

R-Series : Research : Ready-pour systems:

P-R-N substrate

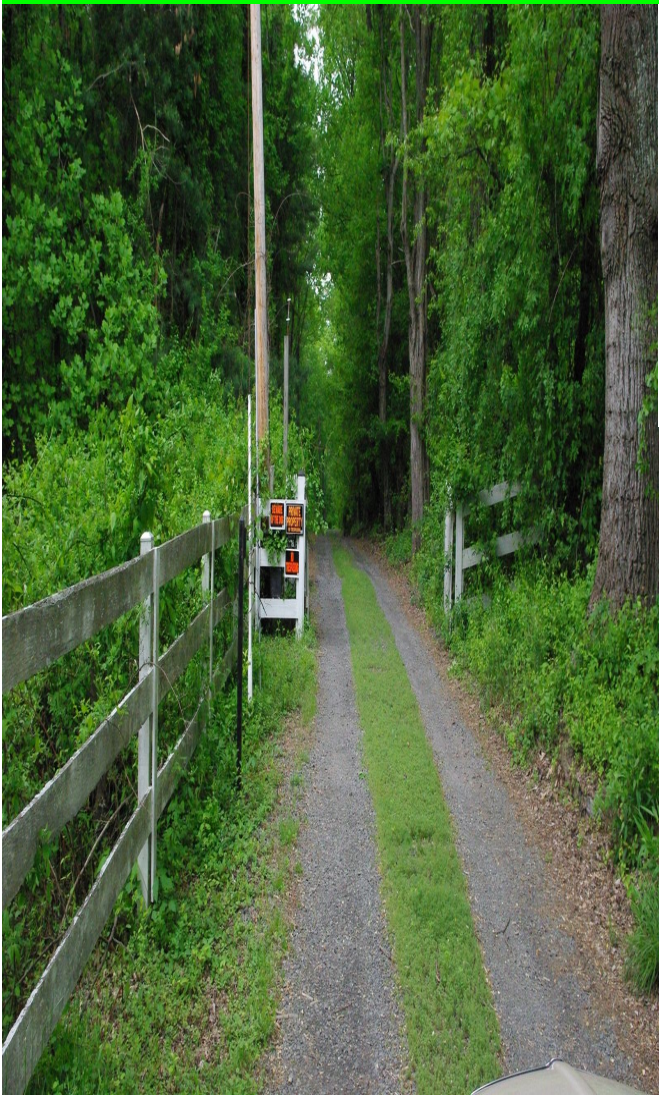


PEC DSE technologies implemented directly into the roadway are purely energy efficiency devices, with only positive impacts on traffic, of greater traction and speed control.

Piezoelectric devices are clear demonstrations of this phenomena, however, we have been able tap the fundamental force, similar to quantum tunneling to capture kinetic energy directly.

GSE is researching pourable methods such as macro or nano scale capillary actions in materials such as a porous form of polytetrafluoroethylene are one promising method. While a pourable multi-layered PRN (Positive doped, Resilient, Negative doped) mat, when combined with flexible road surfaces, can provide highly efficient energy conversions, combined with low construction and maintenance costs.

Roadways fitted with integrated PEC technologies convert 85-90% of dissipated energy into useful energy, as opposed to the 20-30% efficiency of piezoelectric devices, at 1/10 the cost of original construction and maintenance.



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