

# **. Major Project Recap**

## **1. eLLV Project and Car Conglomerate**

Repair and Retrofit the USPS LLV and convert into eLLV

### **1.1. eLLV Project Principles**

Clean and etch, repaint and reuse the body, save on panel construction.

Where necessary, avoid rivets and go with laser or linear friction welding.

Replace windshield with novel heated/defrosting windshield with graphenated ceramic glaze for durability and visibility.

Use Elaphe or similar hub motors (axial motors)

See if Canoo skateboard is compatible or convertible into something to fit as alternative, plan for Next Generation Delivery Vehicle (NGDV) development.

### **1.2. Company Integrations**

Canoo

Lordstown

Workhorse

Greenpower

Lightning eMotors

Mullen / Bollinger

#### **1.2.1. Canoo**

Skateboard promising engineering.

In need of funding.

#### **1.2.2. Lordstown**

Engineers, some cash on hand, still potential for Endurance

### **1.2.3. Workhorse**

Relationship with Greenpower

Attractive Class 4 Delivery Vehicle

### **1.2.4. Greenpower**

Has developed attractive Class 4 vehicle

Relationship with Proterra

### **1.2.5. Lightning eMotors**

Retrofit experience for larger chassis electric vehicles

Relationship with Proterra

### **1.2.6. Mullen / Bollinger**

Ready-to-go Chinese import and conversion of low-cost utility van

Ownership of Bollinger - potential for mid-phase expansion

### **1.2.7. Proterra**

Battery experience

Bus market fits in with larger infrastructure scheme (intermediate bus links)

- Has since been sold to Phoenix for the bus aspect, Volvo (Chinese-owned) battery division- - questionable market monopolization by Chinese interests

## **1.3. Minor to Major Transition**

Starting from the bottom and building up

### **1.3.1. Firehouse Automotive Lab**

Property in Maryland, a few million dollars to establish

Base of operations for retrofit prototyping, relationship with USPS

### **1.3.2. Stanley Factory Acquisition**

Large Texas factory availability, potential use for immediate retrofit center

### **1.3.3. Baltimore Manufacturing Center**

Potential for Port Establishment during planned renovation/development

Fits in with Baltimore redevelopment programs

Low cost property with office space availability

### **1.3.4. Oklahoma City Buildout**

Centralized location for retrofit rollout

Location of Canoo development facilities

### **1.3.5. Redding CA West Coast Fabrication**

Intended extension of Pacific Coastal Corridor, centralized on West coast

- Price sensitive for location selection
- Presently equires build-out

### **1.3.6. Incorporate Manufacturing Centers along Proposed Railway Alignments**

Generally plan for a national distribution of vehicles for USPS retrofit receipt and send

## **2. California City and Addressing the Immigration Crisis**

Establish a facility as a baseline solution for immigration and homeless crisis

Model for other locations

- Baltimore
- Southern Texas
- Maricopa / Southern Arizona

Incorporate a variety of processing strategies to filter skilled from unskilled labor, establish specialized training and/or education, and move unskilled labor through a process of low-skill development systems plugged into home ownership and generational wealth systems.

### **2.1. 3D Printed Houses and Construction Development**

Use automated and high efficiency construction methods taking examples from circular and modular geometric shape

construction.

Supplement with interior shell implementation.

## **2.2. Tiny Homes and Factory Fabrication**

Factory fabrication of modular wall systems and window/door systems

- mass construct for frame-insertion / stacking / tiered housing complex

## **2.3. Organic Produce and Hydroponics Cleanrooms**

Regimented food production, procedural stepping stone to higher skill semiconductor fabrication.

Functional Triangle Development of Needs:

- Food
- Housing
- Work

Potential for advanced research skill development

## **2.4. Tiny Cars and Manufacturing Skill Development**

Manufacturing using low skill labor

Build-out of a specialized tiny car system in unique geography of California City

Progressive move to other facilities, careers in EV manufacture, repair — supporting long term contract with USPS for maintenance and next “Next Gen” Delivery Vehicle

## **2.5. Semiconductor Electronics and Skilled Labor**

Vertical integration with EV development program

- high skill machinery and system development experience
- build out required labor force for US Manufacturing build-out and supply chain integrity

## **3. Hydroponics and Communal Ownership Project**

Establishment of advanced Hydroponics facilities for mass production beyond communal self-sufficiency

### **3.1. Avocados and Automated Picking Robotics using Computer Vision and LLM/Neural Network**

High Protein, versatile product with long lead time and long production lifespan

### **3.2. Hemp Harvest and Water Conservation Projects**

Experimentation of sustainable plastics replacement and fiber recycling

- potential use in a variety of markets:
- building and vehicle insulation
- panel fiber tensile strengthening
- food / produce packaging material
- fiber suitable for saline hydroponics
- clothing

### **3.3. Linden Trees, Chestnut Saplings and Managed Arbor Greenhouses**

Experimental arbor development program

- Linden for mass production of new city street greenways, carbon capture, thermal shading
- chestnuts for protein supplements and national civics
- associated research with Avocado trees
- potential for sapling growth program for reforestation and/or building material

### **3.4. Carbon Saturation Study on Leafy Green Growth**

Use of gaseous carbon dioxide for leafy green stimulus through aqueous saturation

- prior research indicates improved density of leafy greens with increased carbon intake
- thermal factor potential

### **3.5. Off-Season Berry Production**

Robust production for Healthy diet

Present ow production availability in the US

Off-season gap-fill (geographic / logistics advantage)

Improved water use efficiency via closed loop hydroponics and gas cycling

## **4. Baltimore Redevelopment Scheme and Addressing the Homeless Crisis**

Make use of Present Baltimore City redevelopment program

Incorporate a filter-> education -> labor-to-home ownership model

Integrate grant funding based on San Francisco \$500 - 750 system

Promotion of small business self-sufficiency and/or systemic RAISE model

Block-by-block redevelopment system

School recapture and community center integration with California City communal elements (communal garden, house rehab, temporary tiny home construction, apartment transition, home ownership and career development)

## **5. MagLev and National Rail Network**

Establish particular routes as part of a national grid for transportation and transmission infrastructure.

### **5.1. Major Routes and Prime Connections**

North-South and East-West Transcontinental Routes with targeted short routes

#### **5.1.1. Atlantic Coastal Corridor**

ACC

South Florida to Canada on the East Coast, as a supplement to the NEC

##### **5.1.1.1. Washington DC to Baltimore MD**

City plans for Washington, DC and Baltimore, MD as primary starting route, central to the ACC corridor

##### **5.1.1.2. Miami FL to Orlando FL to Jacksonville FL**

Piggybacking Brightline and present development projects

#### **5.1.2. Pacific Coastal Corridor**

PCC

Fulfilling promise of California High Speed Rail Corridor with direct service, linking two major West Coast rail project proposals into a full link between Mexico and Canada, with special potential on the Southern tip

##### **5.1.2.1. Portland OR to Seattle WA to Vancouver CAN**

Capitalizing on I-5 expansion plans and bridge construction

Facilitating existing interest in this route with an interstate plan

Special attention to the means by which the route traverses Seattle and interplays with the local urban environment as a special case.

Provides a primary impetus for a Canadian Transcontinental Rail Project

#### **5.1.2.2. Los Angeles CA to San Francisco CA**

Addressing the high speed need of a Los Angeles to San Francisco route, with an intermediate stop in San Jose.

Potential overlap with certain features of the CAHSR for synergistic cost savings

Special National attention to this route

#### **5.1.3. Redline Transcontinental**

Redline Transcontinental

Signature Route between Washington, DC and Los Angeles, CA through the center of the country, from coast to coast.

Special overlap with the ACC between Raleigh, NC, Richmond, VA and Washington, DC for improved throughput

#### **5.1.3.1. Los Angeles CA to Phoenix AZ**

Primary leg of two major Transcontinental routes: Redline, and Gulf

Potential for Aqueduct system integration and solar canopy

One leg of the LA - LV - PHX MagLev Triangle

Additional Aqueduct and Water Balancing system to Las Vegas, NV from Phoenix, AZ

#### **5.1.3.2. Washington DC to Richmond VA to Raleigh NC**

ACC and Redline Overlap

Development of this part of the corridor connects with the intended DC - Baltimore route, and fulfills both ACC and Redline requirements

#### **5.1.3.3. Raleigh NC to Charlotte NC**

Charlotte and Raleigh are high growth areas in North Carolina and serves as one of a few potential in-State city to city links for MagLev utilization

Traffic in Charlotte in particular has special mitigation needs

Facilitates present desires of transportation improvements in the area, with connection to planned Amtrak North-South alignments in the region

#### **5.1.4. Gulf Coast Corridor**

GCC

The Southern split of the Los Angeles to Phoenix part of the Redline route, linking Los Angeles, CA and Jacksonville, FL along the Southern (Gulf) Coast

Special consideration for weatherization improvements and seismic resilience

#### **5.1.4.1. San Antonio TX to El Paso TX**

A very long stretch that establishes the intent of the project within Texas proper. High expense, marginal payoff, but critical to the system.

Maximum benefit of straight-line MagLev Corridor, taking advantage of improved MagLev technology.

#### **5.1.4.2. Phoenix AZ to Tuscan AZ**

Short route with immediate need, facilitating low cost, high frequency linkages between two major metropolitan areas.

Potential for very high returns with low up-front cost by virtue of short distance

High marginal costs comparatively for station development

Potential for solar canopy system and aqueduct link (potential pipelines versus half-pipe aqueduct)

#### **5.1.5. Westward Rail Aqueduct**

Intent to facilitate water balancing and reservoir emergency supply through Coastal pumping stations

Commercial cost comparisons to water import and emergency transmission

Links between Los Angeles and Phoenix / Tuscan as part of the Redline/GCC

Priority consideration pursuant to demand in Salt Lake and Las Vegas

- Lake stabilization measures as supplement to conservation for Lake Mead and Great Salt Lake

Salton sea brine discharge model within desalination program, with supplement to lithium extraction.

#### **5.1.5.1. Los Angeles CA to Las Vegas NV to Salt Lake City UT**

As a rail route, linking the Redline to the International Corridor (San Francisco to Toronto, CAN connection to Canadian Transcontinental route)

As an aqueduct, establishment of a water pipeline to supplement Las Vegas for drought stabilization with brine distribution within a desalination model.

Continuation of the pipeline to Salt Lake City with discharge with brine treatment into Great Salt Lake.

#### **5.1.6. Canadian Transcontinental**

Vancouver to Dartmouth, linking multiple North-South American lines with Canadian termini at major metropolitan areas.



#### **5.1.6.1. Ottawa ON to Montreal QC**

Overlapping the Canadian Transcontinental and the International Line

#### **5.1.7. MidEast Railway**

North-South bounding connecting to the primary Amtrak hub in Chicago, intersecting all East-West transcontinental routes with terminus in Mobile, AL on the Gulf Coast Corridor.

##### **5.1.7.1. Green Bay WI to Milwaukee WI to Chicago IL**

Primary short route for a regional connectivity scheme

- Green Bay Connector serves as interlink point

- Milwaukee serves as Lake crossing point

- Chicago serves as major transportation hub point

The primary interest within the MidEast corridor is otherwise linking Chicago and Mobile with high speed freight, as an access point on the Great Lakes and serving as an impetus for freight expansion on the Gulf Coast and developmental spur for “inland ports” and advanced distribution hubs within the center of the interior of the country.

#### **5.1.8. MidWest Railway**

Primary interlink between Texas and the major East-West Transcontinental routes, provides a major connection between the Gulf Coast Corridor (GCC) and the Redline Transcontinental route.

- Ultimately serves to connect the Gulf Coast at Houston, TX to Canada at Winnipeg.

##### **5.1.8.1. Dallas TX to Oklahoma City OK**

The primary link between oil production centers, and a port connection to Oklahoma City, OK from Houston, TX upon completion of the Texas Triangle. Dallas and Oklahoma City are major metropolitan powerhouses with a burgeoning interest in high speed rail, alongside potential for vehicle manufacturing expansion.

#### **5.1.9. Northern International Railway**

San Francisco, CA to Quebec City, CAN, the Northern International Railway serves a major US - Canadian partnership project, overlapping substantially with the Canadian Transcontinental route.

### **5.1.9.1. Chicago IL to Detroit MI to Toronto ON CAN**

A major feature of the route, alignment quality demands transformative improvements to the transportation system in the region, by way of additional routing.

Linking Chicago and Toronto would be to link the major transportation hubs of the United States and Canada, facilitating further advancement of associated links (such as Toronto to Ottawa, an otherwise unattractive cost-benefit proposition without the pre-established link).

### **5.1.10. Green Bay Regional**

The GBR is a regional demographic expansion project, linking the major hub of Chicago by way of the Midwest Railway with priority on the Chicago to Green Bay route. Linking Minneapolis creates growth potential, and ultimately creates the potential for Fargo and North Dakota to be included within the broader national scheme at priority.

#### **5.1.10.1. Fargo ND to Minneapolis MN to Green Bay WI**

In terms of priority this may be in the top 3, as a factor in Canadian relations and buildout of a Canadian Transcontinental Route in colder climates using MagLev.

## **5.2. Freight Highway System**

Expansion and co-development feature of the MagLev Rail Project, this aspect of the build-out is designed to facilitate parallel and regional connectivity, providing a safe and secure avenue for AV Freight integration and testing, using novel communication systems and Vehicle-to-Vehicle (V2V) navigation reactivity and data sharing.

### **5.2.1. Features and Benefits from the Rail Infrastructure Development Scheme**

Potential for Automated Multi-modal freight distribution using High Speed Freight connected to Automated Gantry loaders.

National -> Regional -> Local -> Last Mile

Data Tracking with integrated Manifest and Bill of Lading validation and GPS/Handoff tracing creates more precise estimation models within the network.

Synergistic Infrastructure development (Liquid Hydrogen, LNG, Water, Electric) provides for intermediate transportation hubs along the National routes.

## **5.3. Olympic Readiness Program**

A model for prioritization within the framework of a system roll-out.

Special consideration to US Representation and Hosting within the Olympics Hosting timeline.

### **5.3.1. Incorporation of Line Plan in Priority Funding Measures**

Los Angeles, Salt Lake City, and Washington, DC have guaranteed and potential hosting duties between 2028 and 2042. Routing prioritization and funding timelines for the purpose of planning and cash flow can be informed by the intended hosting schedule, with subsequent attention to station build-outs for the purpose of hosting accommodations.

### **5.3.2. Los Angeles CA in 2028**

The Brightline connection between Los Angeles and Las Vegas is planned to be completed by 2028.

### **5.3.3. Salt Lake City UT in 2034**

A further connection between Los Angeles CA and Salt Lake City UT could be established between Las Vegas NV and Salt Lake City UT.

A connection between San Francisco CA, Sacramento CA, Reno NV and Salt Lake City UT could be established by 2034.

### **5.3.4. Washington DC in 2042**

The Redline and/or Atlantic Coastal Corridor (ACC) could be established by 2042, with the accompanying Olympic Stadium plan for the hosting duties at the RFK Stadium complex.

## **6. Research Laboratory**

A variety of specialized research endeavors to facilitate specific objectives within a few interconnected specialties.

### **6.1. Carbon Capture Research and Material Science**

Integration of Carbon Capture / Conversion methodologies with Material transformation and strengthening approaches.

#### **6.1.1. Graphene Synthesis from Methane, CO and CO2 Sources**

Conversion of gaseous byproducts diverted from carbon storage caverns into a productive synthesis program.

Potential overlap with Desalination efforts, with Calcium Carbonate and methane offgas.

### **6.2. Desalination and the Aqueduct Project**

Integrating Reverse Osmosis and novel efficiency approaches, coupled with graphenated and fluorinated membrane development.

Examinations of pipeline manufacture and liquid transmission physics, combined with material science examinations involving pipeline coatings and turbine accelerators/flow control.

### **6.2.1. Aqueduct Routes and Features**

Specific needs on the West Coast, from sites adjacent to the Pacific Ocean such as San Francisco, Oakland, and Los Angeles. Alternative Mexican source at Puerto Pesco.

#### **6.2.1.1. Los Angeles CA to Phoenix AZ**

Overlap with the infrastructure build-out of both the Redline Transcontinental route and the Gulf Coast Corridor route. Part of the Western Triangle, where at least 2 of the legs could maintain a pipeline connection. This route would serve as the singular or improved access to fresh water desalination, with an alternative source from Puerto Peñasco, MX

#### **6.2.1.2. Los Angeles CA to Las Vegas NV to Salt Lake City UT**

Likely Huntington Beach pipeline source and pumping station, facilitating a pipeline/aqueduct adjacent or co-located with a rail line from Los Angeles to Las Vegas and on to Salt Lake City. This route could be covered with a solar canopy, aiding in the power needs of the intermediate pumping stations.

#### **6.2.1.3. Elevated Sluice-Aqueduct with Periodic Pumps**

An elevated sluice would provide for a bulk force rise at the initial source, with the sluice being elevated above city obstructions, using primarily a gravity drop for large sections of the route.

Pumping stations would keep the flow rate high, and the isolation of the system would permit such high forces without unnecessary risk to life.

Additionally, solar canopies and full cover could additionally serve this need.

Brigham Young has done an analysis of a pipeline from the West.

#### **6.2.1.4. Solar Canopy with Hydrogels**

In the Western States where the sun shines and the routes are either elevated above or apart from any man-made or natural shade obstructions, solar arrays aligned with the aqueduct route provide a power supply for any co-located utilities and/or pumping features that dynamically maintain the appropriate flow rate within the system.

Hydrogels serve to absorb water vapor from the system based on the heat profile and evaporative state, with potential to serve as a cooling agent for the panels above while passively generating fresh water along the route, which can be collected, or not, depending on the economics.

### **6.2.1.5. Hydrophilic Coating Layer of Concrete Sluice**

Advancements in graphenated coatings and manufacturability of fluorinated graphene sheaths may provide a low friction surface on which water can travel. Friction losses and heat generation from rough channel routing may yield substantive gains over extended operations, and marginally improve pump throughputs as a result of reduced ambient friction profiles along the totality of the route. Such a surface coating is also demonstrably an improvement to corrosion resistance and a physical barrier lining to prevent abrasion and particulate buildup.

## **6.3. Scientific Inquiries**

Some specific studies in pursuit of various listed objectives

### **6.3.1. Thermal Evaporation and Hydrogen Production Improvements through Vibratory Friction and Cavitation**

Using high frequency rotational and linear action, induced cavitation should produce thermal energy release from the aqueous medium. In turn, vaporization would promote transmission through a porous membrane, separating out sodium as demonstrated in the MIT lab, using a graphene layer.

Additional fabrication methods for membrane construction can be implemented to further facilitate separation for the purpose of desalination and hydrogen generation, by virtue of localized separation of H<sub>2</sub>O into its constituent parts. .

### **6.3.2. Performance of Fluorine-doped Graphene Filters for Reverse Osmosis Desalination**

By virtue of the subsurface features of graphene, fluorine-doped (hydrofluoric) graphene membranes should assist low friction transport of water molecules, in a similar manner as the proposed sodium transport method through vaporization.

Multi-layer graphene for Reverse Osmosis separation would produce high efficiency potable water with low soiling rates on the membrane by virtue of the low friction surface, permitting both lower active energy usage rates and longer utilization rates, and lower overall cost per cubic foot of water produced.

### **6.3.3. Vaporization Factors of Vibratory Cavitation on Sodium Transport via Aligned Carbon Nanotubes**

As mentioned in the Thermal Evaporation and Hydrogen Production Improvements through Vibratory Friction and Cavitation proposal, per the MIT lab study, vertical separation of sodium from saline brines through pressure differentials during vaporization at the point of a vapor layer above the surface of the aqueous medium can be achieved with high surface area cavitation and improved transport features of the membrane and its surface.

### **6.3.4. Passive Solar Evaporation with the use of Fresnal and Concentrating Lenses**

Combining Solar Concentrators and heat-trapping materials, the use of focusing lenses for the purpose of passive thermal desalination can be achieved in a solar panel evaporation hybrid system, distributing heat away from the perovskite cells and into the saline solution serving to regulate the overall temperature of the panels as it simultaneously results in evaporation of the brine coolant into potable/fresh water.

#### **6.3.5. Gamma Ray Absorption through the examination of efficacy of Gold-Lead-Alumina Evaporative Systems**

Combining layers of low thermal conductivity, high transmission, and dense materials in liquid or otherwise gamma-ray-absorptive formation, a multi-layer tubular concept would serve to concentrate solar energy by gamma ray absorption for the purpose of thermal evaporation.

This principle could in theory provide a layer of energy absorption in nuclear energy capture facilities, combining traditional steam generation with desalination features within the main structure, improving gamma ray capture from nuclear fission and associated radiation.

#### **6.3.6. Carbon Capture Measures from various Desalination Techniques**

Both through first-phase aqueous carbon dioxide saturation methods (creating high pressure H<sub>2</sub>O / CO<sub>2</sub> environments for the purpose of carbon absorption into the water medium), and through subsequent desalination efforts downstream, the question of carbon dioxide saturation of thermal capture and evaporative characteristics is to be studied. As part of traditional RO desalination methods, calcium carbonate is a regular byproduct, and the levels of calcium carbonate through utilization of lime or other calcium-rich material may aid the fallout of carbon during the desalination process. In turn, the calcium carbonate byproduct can be used as a feedstock for concrete and other secondary products.

#### **6.3.7. Effects of Carbon Dioxide Saturation on Thermal Reactivity within a Thermal Desalination Scheme**

As mentioned in prior project proposals, the study of carbon saturation on the various experimental functions would be helpful to determine the functional viability and economic rationale for including carbon dioxide impregnation and extraction within a desalination system.

### **6.4. Concrete Facility and Development Scheme**

A lot of concrete will be required for the build-out of the infrastructure scheme. For the purpose of low cost, high durability, high strength product, and simply having a reliable supply of concrete along with experimentation of in situ and factory-based curing methods, integration of carbon dioxide and other carbon feedstock into the concrete production methods are to be studied.

#### **6.4.1. Integration of CO<sub>2</sub> Curing Process from Concentrated CO<sub>2</sub> Sources**

Having a specialized high-carbon atmospheric curing environment in a factory setting may yield higher-strength concrete for the purpose of “Ultra High Strength Concrete”, which aims to provide multipliers of efficacy for the same yardage of concrete, both allowing for slimmer profiles and lower cost-per-mile of infrastructure built.

#### **6.4.2. "Roman Concrete" Experimentation with Calcium Carbonate as Self-healing Mechanism**

Calcium Carbonate, lime, and volcanic ash-like material serves as the basis for high resiliency “self-healing” concrete best used in marine environments or high humidity environments. When the calcium carbonate and lime is exposed to the elements, the materials react with the water in the air, causing the concrete to “foam” within the cracks, causing the “wound” to seal, creating a stronger joint less likely to continue to fissure.

#### **6.4.3. Integration of Graphene Sheet as Tensile Binder**

Graphene mesh is both highly resistant to penetration and has good tensile strength as an addition to traditional rebar and steel mesh reinforcement. As graphene is also resistant to corrosion, creating a low cost manufacturing method for large rolls for column production would result in a high strength solution allowing for novel formation techniques and 3D-printed light-weight prefabricated cylinders, making use of air-gaps and expanding “concrete foam” as filler. Alongside high strength reinforced outer layers with a dense core. The combination of rigid internal members and flexible outer layers should facilitate flexible forms during earthquakes, reducing likelihood of catastrophic failure through complete separation or total exposure of steel reinforcement.

#### **6.4.4. Integration of Graphene Flakes as Aggregate Stabilizer**

The nature of aggregate in cement and concrete manufacture can aid the stabilization and density of the components thereof as an additive alongside sand, coffee grounds, fly ash, impregnated hemp fiber, carbon fiber. Graphene flakes may imbue certain binding improvements to the finer characteristics of the cement mixture (such as Portland cement), increasing overall holding strength during compression and/or tensile strain.

#### **6.4.5. Utilization of Fly Ash and Performance Measurement in conjunction with other factors**

Quality of fly ash as an aggregate additive should be examined so as to determine the various important aspects of disparate types of fly ash based on the combustion method and type of fuel source used. Demonstrable characteristics based on heavy metal composition (derived from type of coal used to produce the ash, temperature characteristics of the burn method, and other various aspects of power generation from fossil fuel combustion) could be identified, and value calculations performed so as to determine cost-per-cubic-foot of fly ash of one type or another.

Within the sourcing potential matrix, age and “cleanliness”/“purity” of the fly ash source may become determining factors in source selection. Additionally, “fly ash cleaning/leaching” may yield economic advantages from harvesting trace rare earth elements, if such elements are unimportant to the binding characteristics of the ash within the concrete aggregate mix. This is especially true if characteristics of the heavy metal and rare earth mix can be supplanted/replaced with low

cost carbon-rich additives such as coffee grounds and high-yield, low quality “irregular” graphene flakes.

#### **6.4.6. In-Situ Formation of Earthwork using Concrete Additive Material**

Study of mobile form-works potential in various geographic regions alongside methodologies for material separation during excavation of cut-and-cover trench build-outs and tunnel construction. In particular, those areas most difficult for TBM movement in high clay environments may yield highly suitable building materials for adobe temporary housing and other basic structures, and areas with high sand content and low particle size materials may provide ample cement mixture components. Likewise, rocky terrain may produce supplemental aggregate for both ballast and low quality concrete, or otherwise material to be ground down into finer material suitable for high-grade concrete.

Mobile ceramic kilns and concrete curing facilities would potentially reduce logistics costs for both form delivery and excavation removal. Use of such a system would synergize with on-the-fly steel production within a mobile forge, where potentially slag could be added to the concrete mix, allowing for low-waste, low logistical overhead operations. Ball mill grinders, material separators, sluice and gravity dividers could be employed alongside a dredge system particularly for long stretches of cut-and-cover construction, integrating the separation and grinding apparatus into the dredge train.

#### **6.4.7. Binding Characteristics of Graphenated Steel Rebar Reinforcement**

Examination of the protective and binding characteristics of low friction/high corrosion-resistance graphenated sealant on traditional steel rebar concrete reinforcement. Study of whether concrete separation occurs more readily within high vibratory fractures and tensile strain.

### **7. Battery Science with Lithium and Sodium-based liquid, gel, and solid state configurations**

A multitude of studies are to be undertaken to examine various characteristics of battery formation types, using a variety of novel material uses and implementation methods.

#### **7.1. Study on Battery Longevity from Anti-Dendrite Electrical Pulses through the principle of Magnetic Degaussing**

A common issue in battery reliability is the growth of lithium dendrites, impacting both ion intake at the anode and ultimately the potential of metallic arcing within the battery itself, leading to combustion and vehicular immolation. Fires of this type happen routinely, as a matter of manufacturing limitations and the reality of metallic lithium formation on the anode surface. This impact result in either or both degraded battery capacity and charging speeds and/or higher thermal friction rates within the battery, both in natural discharge and during charging, resulting in trapped chemical thermal states that result in a chain reaction towards combustion within the battery, making it difficult to detect and extinguish.

There is a chance that dendrite formation could be avoided or mitigated through the principle of magnetic degaussing, on the principle that through the static electric quality of ionic flow through the metallic lithium, atomic lithium deposits form and magnetize outward, creating the arc paths and otherwise blocking ionic flow paths through the buildup on degraded



lithium structures. By inducing a strong electric pulse through the battery, the aim would be to demagnetize the anode, allowing particles to fall away from the lithium anode. Additional capture methods could theoretically be employed, or a schedule of regular battery maintenance, or the act of degaussing on a frequent basis (as historically was the case in Cathode Ray Tube computer monitors) could prove sufficient.

## **7.2. Study of Ionic Flow Rates through Graphenated Anode Sheath with Magnetically-aligned alloyed carbonic nano-tubes**

A highly regulated study in vacuum and magnetic isolation for the purpose of linear uniform metallic-doped graphene carbon nanotubes on a diamond anvil lattice. Uniform graphene mesh with magnetically-aligned transport structure may be then fused to a copper or lithium structure forming a “sheathed” anode, restricting dendrite formation and improving overall ionic throughput.

## **7.3. Develop a gel-solid hybrid battery with superconductive graphene membrane**

Using the manufacturing methodology for solid-state batteries and coupling it with a gel electrolyte may yield improved ionic flow rates with or without improved solid state forming methods (chemic vapor deposition, atomic sintering, magnetic alignment, plasma forging).

## **7.4. Study of Weight Savings and Energy Density for Solid-State versus Traditional Lithium-Ion Batteries**

A simple measure of energy density as compared to traditional lithium ion and lithium iron phosphate batteries.

## **8. Energy Storage and Nuclear Production Integration**

Macro economics and energy balancing study to examine the viability and prudence of integrating high yield long-term nuclear energy production with distributed large scale energy storage solutions such as elevated reservoirs, molten salt/sand/aluminum thermal storage facilities, and other “smelting”-integrated facilities for on-demand production value and refining usage rates during off-peak. Specifically for “energy as the economic driver” projects where capital costs are not the determinant factor in long term economic success (such as material commodity yields, or where supply is largely guaranteed and oscillate on the basis of energy demand/supply.)

## **9. Nuclear-Hydrogen Hybrid Turbine Engine**

Initial inquiry into a hybrid nuclear-hydrogen engine, whereby steam drives a turbine and the ambient thermal state of the water evaporate is, rather than recycled into the system, converted into hydrogen and oxygen.

Studying of “thermal economics” of liquid hydrogen fuel source coupled with nuclear fission coolant with hydrogen boiling and gas production as an energy capture offshoot (hydrogen fuel cell and/or combustion)..

## **10. Cold Climate Quantum-locked Flywheel Storage**

In a colder climate environment such as Alaska or Canada, a study of energetic losses with the aid of liquid hydrogen supply and a quantum locked flywheel for zero-friction energy storage, supported by improved ambient thermodynamic loss profile.

## **11. Molten Salt Batteries**

Examination of methods and approaches to thermal plate to plate transfer and isolation / insulation techniques, used especially in conjunction with periodic energy production (day or seasonal cycles).

## **12. Molten Aluminum Batteries**

Examination of methods and approaches to thermal plate to plate transfer and isolation / insulation techniques, used especially in conjunction with periodic energy production (day or seasonal cycles).

Refractory methods and thermal radiation shielding studies for high-temperature energy storage. Energy production + forge complex? Hydrogen burn-off plus battery storage for daytime usage? Ie, burn hydrogen at night so as to reduce draw during peak cost-per-kwh during the day.

## **13. Fiberoptics Rollout and the Stadia Project**

Incorporating Long Distance Fiber Backbone Infrastructure into the design parameters of the rail network for the purpose of establishing additional internet capacity and a dedicated Stadia network architecture for data streaming protocols at the hardware level, interconnecting Stadiums/Arenas for the purpose of International Competition as well as Regional/National Tournament Competition.

### **13.1. Targeted Train Urban Hub with connected Entertainment Venues**

Certain cities have alignments conducive to integration of a rail hub alongside existing arenas and entertainment hubs.

#### **13.1.1. Las Vegas**

The Coliseum in Las Vegas is set to be renovated or demolished, and would function as a dual-use venue for transportation and entertainment with potential for specialized hotel accommodations.

### **13.1.2. San Jose**

Establishing a transportation hub in San Jose at Diridon Station provides opportunities for co-developing Entertainment venues within the city alongside Google, who is establishing a community neighborhood model in the area at or near Diridon Station. San Jose lacks major sports teams, and was one of the fastest growing cities until very recently. Re-establishing a growth pattern for the area would be benefited by stadium construction and adoption or development of Major League sports teams, as well as establishing an esports scene in a nascent high-earning, low-availability entertainment space. Potential interest from Masayoshi Son and Softbank on the basis of real estate and sports team investment opportunities in an exciting tech-centric environment.

### **13.1.3. Baltimore**

The DC-Baltimore route is meant to establish an early proving model for city adoption of high speed rail and MagLev projects with associated urban transportation hub development, in conjunction with new or existing accommodations and entertainment spaces. In the case of Baltimore, the proposed entry point to the city is directly adjacent to the Baltimore Orioles stadium at Camden Yards, which is also directly next to the Convention Center and accessible to the highly touted Arena. Integration systems would link the various amenities, and promotional elements would be incorporated into the transportation development scheme for the purpose of “sister-city” relationships with DC. Facilitation of mutually-beneficial two-way access to entertainment facilities will be beneficial to “off-peak” usage of the rail network as a result of promotional packages associated with major events at the entertainment complexes on either side of the DC - Baltimore route.

### **13.1.4. Washington DC**

There are multiple proposed sites for the DC MagLev Station, but one potential site is on the North side of the RFK Stadium Complex. The proposal for the site is to establish an Olympic-ready sports complex accommodating NFL, NHL, and indoor MLS matches, alongside potential for Arena-style eSports uses and “minor league” sports events such as Ultimate (DC Fray, DC Breeze), and other communal activities. As the site is along the DC Streetcar route and accessible via Metro at Stadium Armory, the link is highly connected to the broader City transportation network, which makes commuting and event attendance both major functional goals of the rail system. As “Digital Twin” broadcasting and presentation methods are developed, national high-speed and high-capacity data transmission networks will be desirable for regional, national, and international broadcast.

### **13.1.5. Austin**

As a burgeoning urban tech area, and with the Austin Station proposal set to be closely aligned with the newly-renovated Austin Convention Center, major eSports events could become a major attraction for the area. San Jose, Austin, Las Vegas, and DC are all potential hubs for eSports fandom on both a “Major Event” schedule as well as day-trip accessible attraction. As with other sites with eSports and Major League sports attractions, broadcasting capabilities are facilitated by ample speed and throughput of dedicated network infrastructure.

## **14. Fiberoptics Rollout and the US Intranet Project**

Alongside the general internet data backbone, a separate network infrastructure system would be established to link the nation's libraries by a secured intranet serving the US Library System and USPS hubs, facilitating both static information sharing through the libraries and governmental systems, in addition to dynamic data sharing via the USPS system.

Access to Library checkouts would be accommodated through novel "Web3" file sharing and ownership tracking paradigms, while the dedicated network might facilitate "eVoting" in remote locations, or a digitization strategy for Absentee Voting (digitization kiosks facilitating both printing and transmission of a digitized signature/ballot).

As there has been interest and potential for establishing a lightweight USPS Banking system, having a more isolated network with a reliable backbone would provide for the necessary backend hardware to facilitate such an endeavor. In theory, such a network could be established in complete isolation from the other governmental systems, providing for a zero-trust access paradigm in addition to the hardware isolation of the dedicated network infrastructure.

### **14.1. USPS Banking and Electronic Transmission**

Integration of a dedicated network infrastructure for the purposes of a USPS data transmission system would allow for the proposed USPS banking scheme to be implemented. By virtue of an isolated network, the reliability, availability, and security of the banking transmission system would allow for seamless money transfers alongside digital receipts and zero-tracking reliable payments by IRL or Digital Mail up to some amount.

A "two-factor" money transfer system would be facilitated by a digitization strategy linking physical disbursement alongside a digital "handshake" upon receipt, or otherwise a scanning of the physical transmission receipt and the associated escrow release facilitated by the USPS banking system.

### **14.2. Library Interconnect and AI Aggregation**

The linkage of local, regional, and national library systems would allow for broad digitization strategies and facilitate automatic supply balancing via a "Library API" for the purpose of providing or supplying in-demand books. Additionally, data tracking would allow for statistical analysis for current and future physical book deployment.

#### **14.2.1. Decentralized Election Systems and Electronic Voting**

Using either or both Libraries and USPS facilities for transmission of balloting (pickup and resubmission, with physical and electronic ballot receipt/tracking) as a part of the Absentee and Mail-in voting programs as regulated by the State, voters would be able to perform their civic duty with more flexibility than currently exists while providing for a more secure and reliable method for ensuring the ballot reaches the desired recipient and is transmitted by the appropriate voter. As USPS facilities would typically be equipped with digital signature devices for package sending and receiving, self-verified signatures (transmission, self-validation of digitized signature, printed receipt with physical signature) would allow for methods of voter confidence, and allowed transmission of vote tabulation to 3rd parties on a release schedule for the purposes of election projections and tracking in line with data privacy practices.

## **15. Rail Track Deployment and US Steel**

While the bulk of the infrastructure would be built independent of the rail laying so as to stagger the development timeframe as needed, rail laying and preparation would be a critical component of the final construction of the national high speed rail network for the purposes of facilitating an improved traditional passenger and freight railway.

### **15.1. Development of Dynamic Rolling Forge System**

A model for a mobile forge, self-laying and dynamic forging technique, using novel rotational and linear friction techniques to build rail without the need for labor-intensive and time-consuming Thermite welding and grinding.

### **15.2. Take Lessons from Concrete and Metallurgy Lab for Concrete Deployment**

As mentioned in another section, a Concrete and Metallurgy lab would hopefully provide novel insights into “recipes” for various development scenarios, providing for advanced construction techniques during the infrastructure build-out.

### **15.3. Alloy Determinations based on Region and Climate Models**

Novel alloys and right-fit production based on geography and physiological risk to the rail and pipeline infrastructure based on geological, climate, and seismic risk.

### **15.4. Graphenated Sealants for Crack-Resistant Alloy Rail**

Examination of specialized Steel Alloy sealants, with special attention to graphene as a highly resistant and low-friction surface membrane, with potential for renewal applications, reducing wear on the underlying steel track and reducing maintenance cost and derailment risks.

### **15.5. Experimentation of Wheel-side Graphene Sheath and Rail-side Graphene Sheath**

Stress testing of novel bi-layer sheathing for the purpose of improving friction profiles based on weight applications and temperature variances, with potential for closely defining ideal weight-to-friction ratios based on routes and style of rail car / anticipated loads.

## **16. Pipeline Deployment and Manufacturing Systems**

Similar to proposed rail laying techniques, using rotational friction to “weld” pipe segments together from a theory perspective seems like the ideal method for dynamic in situ deployment of pipeline systems. Additional sealant methods for both the interior and exterior would be facilitated using modern “pig” raceways and exterior coatings by mechanical affixing or specialized spray machinery.

### **16.1. Carbon Dioxide Transmission Pipelines**

Alloy determination based on corrosion profile and sediment frictions, running a variety of lengths for the purpose of facilitating carbon capture and carbon utilization.

### **16.2. Oil and Natural Gas Pipelines**

Examinations of coatings and sealants for the purpose of improving throughput based on reducing internal friction, and incorporating anti-spill technologies and monitoring so as to prevent environmental damage.

### **16.3. Potable Water Pipelines**

Copper and treated Stainless steel pipes would be manufactured for both regional and city (residential) purposes according to an analysis for supply and demand, and costs associated with facility accommodation.

### **16.4. Brine Discharge Pipelines**

Examination of alloy composition for brine transmission, along with hydrophobic low-friction surfaces to reduce risk of material corrosion and sediment build-up.

### **16.5. Liquid Hydrogen Pipelines**

Specific attention to high crack resilient Steel alloys (chromium - cobalt - nickel - magnesium) to contain low temperature liquid Hydrogen for the purpose of facilitating a Hydrogen network for both hydrogen fuel cell and combustion engines, as well as industrial-grade generators and smelting/refining furnaces using “green” hydrogen fuel sources as the thermal fuel source.

### **16.6. Protective Layers and Sealants by Rotational Spray/Sputtering/CVD**

Study of sealant application methods using a variety of techniques as demonstrated in numerous scientific studies, using principles of material sintering and chemical vapor deposition depending on application. Aiming for high-efficiency, low cost application techniques that would improve economic viability of employing highly resilient pipe materials in mission critical applications.