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Study of Illuminating the Future Exploringthe Possibilities of Glow in the Dark Roads

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Abstract : As part of its $245 million road safety program, the Australian government is installing some innovative new techniques to keep not just drivers safe, but cyclists and pedestrians too. The country plans to install photo-luminescent road markings that glow in the dark. The lines on the road will appear normal in the daytime, but in the night, they will glow just like the stars.

In the part of Smart Highways with Glowing Lines the road glow in the dark lines is installed, called Glowing Lines. These lines collect energy during the day and give light in the evening. Here the landscape becomes an experience of light and information. As a result, this increases visibility and safety.

1. Introduction

Glow-in-the dark costumes and glow sticks have made Halloween trick-or-treating safer for children because they can be seen at night. Glow-in-the dark road lines operate the same way by making it easier for drivers to see the road.Anyone who drives at night knows how difficult it is to see road markings, especially in inclement weather, because the paint has faded or the road has recently been repaved, according to Auto Evolution.A trial run using photoluminescence highway lines – that's the process that makes toys and watches glow – in Victoria, Australia began in May 2022 and the results have been glowing, reported . It is part of a three -section innovative project from Regional Roads Victoria to make roads safer.

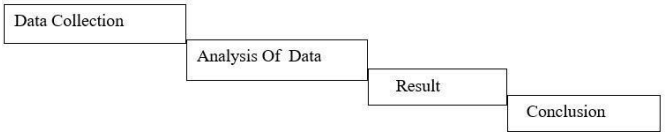
"This treatment will make it easier for drivers to see the line markings or signage and provide stronger definition coming up to intersections and curves, giving drivers more time to react and preventing them from veering from their lane," according to the Regional Roads website.

Glowing Roads

The Grippsland company Tarmac Linemarking used photoluminescence technology to coat the road markings at 70 locations including one kilometer of Metong Road in Victoria during the trial, according to.

At night, the coating emits light that was stored during the daytime so that drivers can see them. While foggy weather may affect the lights longevity, the roadways will be bright during the dangerous dusk period

2. Methodology



The methodology adopted for gift study is completing study of road marking of glowing lines. elaborated study of different techniques like glowing lines road marking, it's paint & dispensed by analyzing price needed for specific methodology and so comparison, price and time needed.

This study is predicated on roads & it's safety. The study target is to improve safety & visibility at night time. the sector study is split into components like – On Google website observation on smart roads to examine and observe Glowing Lines on road & it's luminous paint i.e., fluorescent paint, Phosphorescent paint, Radiolumnescent paint. Finding which is best luminous Paint, Budget & Best way of applying glowing lines paint. Study of similar methods of glowing lines on road marking & comparison study of glowing line road marking & ordinary road marking.

Fig -1: Picture of glowing road

2.1 Method:

Digital Roads. Digital Roads will harness data, technology and connectivity to improve the way the Strategic Road Network (SRN) is designed, built, operated and used. This will enable safer journeys, faster delivery and an enhanced customer experience for all. Smart pavement is an exciting concept that could revolutionize the building, usage and funding of asphalt roads everywhere. To be specific, smart pavement refers to roadways that have been specifically engineered and built to support a wide range of 21st century IT-enabled features; making them "smart" in the process. Smart traffic lights use data from sensors, cameras, GPS, vehicles, cell phones and other devices to detect patterns of traffic and the volume of vehicles, pedestrians and bicyclists approaching an intersection.

Innovative Road Repair and Maintenance Technologies

Smart Manhole Repairing
Stringless Curb&Gutter: The Power Curber 5700-C.
Electric Snow Melting System: Warmly Yours.
A Revolution in Building Roads: PlasticRoad.
Pothole Road Repair: ChipFill.
American Road Patch.
Installation of a Cable Duct Cover: Trigona.

Fig -2 Smart Highway

LITERATURE REVIEW

A. Studio Roosegaarde, Hejimans(2013)

The aim of this paper to the focus of innovation was on the road. Heijmans and Studio Roosegaarde tackle this on a large scale by innovating the road deck with designs such as 'Glow in-the-dark Lining', 'Dynamic Paint', 'Interactive Light' and 'Electric Priority Lane'. Together they want to make the road sustainable and interactive through means of smart lighting, harvesting energy, and traffic signs that adapt to the road situation.

B. Vijay Laxmi Kalyani,Shailee Joshi,Vidhi Chaudhary (2015)

The paper showing that. Now, there is a need to make the highways a smart highway. A Smart highway is the need of present time because a lot of energy is required to illuminate the highway at night we can use Green energy and other supportive technologies like 5G, IoT, Cloud computing for faster data communication and rapid action taking as and when demanded, altogether there is a lot of scope on Indian highways specially to be converted into smart highway it has abundant sunlight so that the power can be collected into storage batteries and that could be used at night.

C. George Justin Sebastian, Randhawane Pratik Dilip, Murhe Abhinav Vasudeo (2017)

The paper is about changing the roads now no longer remain as a medium to travel from one place to another, we can now use it to charge electric cars and harness solar energy due to its large exposed surface area. There is also technology to keep portions of the roads well-lit with more energy efficient and environment friendly technology and methods. Hopefully there will be more upcoming technology to make our roads smarter and safer to trave

D. Pardeep Kumar, Arun Kumar, Stephen Kajesweki (2016)

This paper offers the Innovative practices in the road construction sector requires the involvement of the public and private sector and all other stakeholders for innovation to be successful. There is a need to adopt new technology and new road construction materials as well as processes. There is need to take informed decisions for adopting innovative practices and evaluating the outcomes of each decision taken in terms of the investments and the risks as well as returns and ensuring the sustainability of the road developments programs.

SCOPE OF PROJECT
The present study will focus basically on these following points:
To reduce the bitumen content by the addition of Waste plastic in bituminous mix.
The lifespan of the roads can be increased.
Eco-friendly in nature.

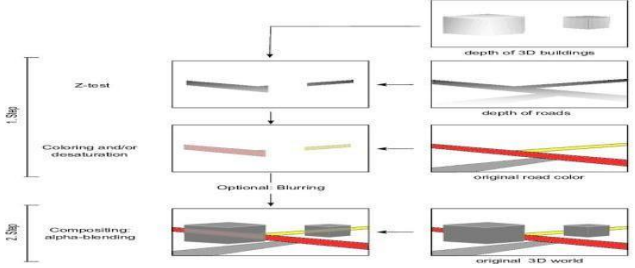


FIG-3 Compount

DISCUSSION ON TOPIC

FIG- 4 : Image while driving on road

Interactive light seeks to detect where cars are on a road and then light only the sections of the road around and in front of them. The aim of this would be to reduce the use of electricity by dimming lighting where roads are empty. Induction Priority Lane, meanwhile, proposes a lane with electric vehicle charging technology embedded under the road surface, whilst Wind Light envisions turbines at the side of the road that generate electricity for lighting using the wind caused by passing cars.

Improve Road Safety in Bike Paths

The new mobility paradigm led to the increase of bike paths and bike lanes all over the world. This new mobility paradigm comes with environmental conscience and authorities want to cut costs and decrease their environmental effect by limiting the installation of lights on bike paths. How can authorities facilitate users' nighttime movement (bicycles, scooters, etc.)

SR-5500L works as a light guide that defines the bike path, giving bikers a great nighttime visibility distance without the need of power. Its Glow in The Dark feature allows this road stud to store ambient light throughout the day and then re-emit this stored energy by lighting the bike path and being visible for a long period when it becomes dark.

Main Content

The Promise of Glow in the Dark Roads

By embracing cutting-edge materials and innovative design, glow in the dark roads present a captivating solution to enhance road safety, conserve energy, and reduce maintenance costs

Improved Nighttime Visibility

* Glow in the dark roads harness the power of photoluminescent materials that absorb and store energy from natural and artificial light sources during the day, only to release it as a soft, ambient glow at night. This results in enhanced visibility in low-light conditions, making it easier for drivers to navigate roads, identify potential hazards, and stay on the right track.

Energy Conservation and Sustainability

* Traditional street lighting consumes significant amounts of energy, contributing to both financial and environmental burdens. Glow in the dark roads, on the other hand, have the potential to significantly reduce energy consumption by negating the need for conventional streetlights during the night. By utilizing sustainable materials and reducing reliance on electricity, glow in the dark roads offer a greener and more environmentally friendly approach to lighting our streets.

Fig-5 : Image of road

Cost-Effective Maintenance

* Maintaining traditional road markings and signs can be a costly endeavor. Constant repainting and maintenance requirements add up over time, straining limited budgets. The luminescent properties of glow in the dark roads provide a long-lasting solution, minimizing the need for frequent upkeep. This translates into potential cost savings for local authorities, allowing resources to be allocated towards other pressing infrastructure needs.

Challenges on the Path to Implementation

While the concept of glow in the dark roads holds immense promise, there are several challenges that must be addressed before widespread implementation becomes a reality.

Fig-6 While work of road

Durability and Longevity

* One crucial aspect facing glow in the dark roads is the durability of the luminous material. These roads endure the relentless wear and tear of traffic, harsh weather conditions, and exposure to various chemicals. Ensuring the longevity of the glowing properties necessitates extensive research and testing to develop durable materials that can withstand these challenges without compromising safety or brightness.

Regulatory and Safety Considerations

* The implementation of glow in the dark roads raises important questions regarding safety standards and regulatory frameworks. It is essential to establish guidelines to ensure that the luminous properties of the road do not distract or confuse drivers, compromising road safety. Collaborative efforts between transportation agencies, researchers, and policymakers are crucial to strike the right balance between innovation and safety.

Fig-7 Final work of road

Conclusion:

he concept of glow in the dark roads represents a transformative approach to illuminate our roads while simultaneously addressing energy conservation, cost-effectiveness, and safety. However, several challenges must be overcome before these visionary ideas become a reality. Through continued research, collaboration, and innovation, we can pave the way to a future where our roads not only guide us but also glow with possibilities.

"Glow in the dark roads offer an illuminating path toward a greener, safer, and more cost-effective future." Glowing Lines apply on edges of road like, 1) Stadard Width of Road marking Line = 100 mm This paint mark in the format of triple Lining i.e.,10mm line
- 35mm space like wise up to 100mm . 2) The glowing line method is useful for road safety and reduce accident. 3) Its first design GLOWING LINES charges during day-time and glow at night for several hours to create an iconic highway experience and increase