

DRISI

CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

Research Notes

Planning, Policy
and
Programming

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Project Title:
Shifting Gears to Sustainability: A
Deep-Dive into Solar-Powered Bike
Pathways

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Shifting Gears to Sustainability: A Deep-Dive into Solar-Powered Bike Pathways

Developing a white paper evaluating feasibility of solar bike paths

WHAT IS THE NEED?

The urgency to transition to sustainable and renewable energy sources is becoming more critical as the impacts of climate change intensify. Transportation infrastructure contributes significantly to carbon emissions, making it a prime target for sustainable interventions. However, most existing solutions focus solely on either transportation or power generation, rarely integrating the two in a seamless manner.

This project addresses the need for a holistic approach to sustainable infrastructure. By incorporating solar panels into bike paths, the project harnesses the dual potential of reducing transportation emissions while also generating clean energy. This innovation addresses not only environmental concerns but also economic and technical challenges, as it aims to evaluate the feasibility of such integrated solutions. As such, it will help towards fulfilling a critical gap in Caltrans' broader sustainability goals by offering a novel approach to greener transportation and energy production, directly contributing to California's emissions reduction targets.

WHAT ARE WE DOING?

In the initial phase of the project, spanning from January 1, 2024, to April 30, 2024, the research team will focus on developing a comprehensive literature review. This review will integrate a minimum of six relevant academic sources to provide a foundational understanding of the technical, economic, and environmental aspects of incorporating solar panels into bike paths. The synthesized knowledge from this phase will inform the subsequent stages of the project.

From April 1, 2024, to July 31, 2024, the team will shift focus to a cost and feasibility analysis, evaluating the practicality of implementing solar bike paths from both economic and technical



DRISI provides solutions and knowledge that improves California's transportation system



perspectives. Concurrently starting on June 1, 2024, and ending on September 30, 2024, the team will engage in stakeholder consultations and expert interviews and summarize the results. The final phase involves compiling all findings into a comprehensive white paper, which will be submitted in PDF format by October 31, 2024.

WHAT IS OUR GOAL?

The ultimate objective of this research project is to generate a robust, evidence-based white paper that serves as a starting point towards a roadmap for the successful implementation and scalability of solar-integrated bike paths as part of California's sustainable transportation infrastructure. This white paper aims to offer actionable, data-driven recommendations to Caltrans and other stakeholders, thereby directly influencing policy and operational decisions to align with both state and federal renewable energy and transportation goals.

WHAT IS THE BENEFIT?

The white paper will provide Caltrans and other stakeholders with comprehensive insights into the feasibility, economic viability, and environmental advantages of integrating solar panels into bike paths. By doing so, it will inform data-driven policy decisions and enable the optimization of state and federal funds allocated for sustainable development and transportation.

Furthermore, the actionable recommendations presented in the white paper will serve as a blueprint for energy-efficient and safer cycling pathways. By identifying best practices and potential pitfalls, the research will empower Caltrans to deploy solutions that not only reduce carbon emissions but also foster a safer, more efficient transportation network for cyclists.

WHAT IS THE PROGRESS TO DATE?

The research has not kicked off; Starts 1/1/2024.

IMAGES



Image 1: Solar Bike Path in the Netherlands; Photo: Sander Koning ANP