# Project Design Phase
## Proposed Solution

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| Date | 20 June 2025 |
| Team ID | LTVIP2025TMID29572 |
| Project Name | Sustainable Smart City |
| Maximum Marks | 2 Marks |

**Proposed Solution :**

| S.No. | Parameter | Description |
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| 1. | Problem Statement (Problem to be solved) | Citizens in growing urban and rural areas face challenges related to sustainability, including inefficient waste management, rising pollution, and lack of development insights. There is limited access to real-time environmental data and clear comparisons between cities and villages, making it difficult for individuals and planners to make informed decisions for sustainable living. |
| 2. | Idea / Solution description | **1. Recycling Assistant** – Uses a generative model to provide eco-friendly disposal suggestions, recycling techniques, and upcycling DIY ideas based on user inputs. <br> **2. Village Comparator** – Allows comparison of key sustainability indicators between villages, supporting Rural development and identifying gaps in resources or policy. <br> **3. SmartCityRAGSolver** – A smart city query-solving feature that uses Retrieval-Augmented-Generation (RAG) to answer sustainability-related citizen questions using relevant knowledge bases. <br> **4. AI Dashboard** – A Streamlit-based visual interface that integrates all modules, provides comparative analytics, and enables user interaction with visual data and models. <br> **5. Dream City Builder** – A feature that allows users to simulate and design their own ideal sustainable city by selecting the best parameters from different real cities or villages, educating them on what makes a truly sustainable environment |

| 3. | Novelty / Uniqueness | This solution uniquely blends advanced AI (LLMs, RAG) with user interaction, covering both urban and rural areas. Unlike traditional dashboards or comparison tools, it includes a **Dream City Builder**, allowing users to experiment and learn by virtually designing a sustainable city. It also bridges the gap between awareness and action through personalized recycling advice and smart query resolution. |
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| 4. | Social Impact / Customer Satisfaction | The system fosters a culture of sustainability by helping individuals understand and take part in solving environmental challenges. Citizens learn how to recycle, compare their village or city, ask questions, and even design a better city — all in one place. Planners, students, and policymakers gain powerful data-driven insights. This improves engagement, awareness, and overall satisfaction. |
| 5. | Business Model (Revenue Model) | Revenue can be generated through:<br>• Subscription plans for smart city departments, educationalinstitutions, And NGOs.<br>• Freemium access for citizens with premium tools (e.g., Dream City export, detailed analytics).<br>• White-labeling to sustainability-focused startups and government agencies.<br>• Sponsored collaborations with environmental brands and green campaigns. |
| 6. | Scalability of the Solution | All modules are modular and cloud-deployable, allowing seamless expansion across new cities and villages. Language support, region-specific datasets, and customizable dashboards make the solution adaptable for different demographics. It can be used nationally or globally, across education, governance, and community platforms. |