Project Design Phase
Problem – Solution Fit Template

Date	28 JUNE 2025
Team ID	LTVIP2025TMID60817
Project Name	Sustainable smart city assistant using IBM granite LLM
Maximum Marks	2 Marks

Sustainable smart city assistant using IBM granite LLM **Template:**

Smart City Assistant (IBM Granite LLM)

1. Customer Problems / Pain Points

- Residents don't get timely alerts about **air quality**, **traffic congestion**, or **waste pickup delays**.
- City planners struggle to access **integrated data** across traffic, energy, and environment systems.
- Communication with city authorities is **manual**, slow, and inefficient.
- Lack of **personalized sustainability recommendations** (e.g., how residents can reduce energy use).
- Complexity of **understanding RAG-based data narratives**: insights may be lost or misunderstood.

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2. Existing Customer Behavior & Mediums

- Citizens monitor local alerts via **social media, municipal apps, SMS**.
- Planners use **dashboard interfaces**, spreadsheets, and periodic reports.
- Public feedback through **helpdesk calls**, emails, or in-person visits.

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3. Proposed Solution

A conversational, intelligent assistant that:

- Integrates with real-time **IoT feeds** (traffic, AQI, energy, waste).
- Processes multimodal data (text + images) via **Granite Vision**.
- Uses **chain-of-thought reasoning** to generate structured explanations lablab.ai+8linkedin.com+8github.com+8community.ibm.com+1forbes.com+1forbes.com+2ibm.com+2ibm.com+2.
- Delivers personalized insights, alerts, and sustainability suggestions to both citizens and decision-makers.
- Embeds directly into existing channels (SMS, WhatsApp, web, municipal apps).

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4. Value Propositions & Triggers

- **Timely alerts**: “AQI just spiked in your area—here’s how to protect your family.”
- **Actionable insights**: “Your energy use is 15% above average—reduce usage by switching to LED.”
- **Data-driven decision support**: “Forecast shows peak traffic at 5 PM; deploy additional buses.”
- **Trust-building**: Transparent logic with chain-of-thought explanations; built-in **Granite Guardian** safeguards community.ibm.com+1linkedin.com+1.
- **Instant access**: No waiting for monthly reports—citizens and officials get info in natural language, anytime.

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5. Channels & Touchpoints

- Chat interfaces on **web portal**, **WhatsApp**, **SMS**, **city apps**.
- Embedded **dashboard widgets** with narrative overviews.
- Periodic **forecast emails** using RAG-generated summaries.

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6. Key Metrics / Success Criteria

- **Engagement**: # of activated alerts and threads resolved via chat.
- **Insight Accuracy**: Alignment of RAG outputs with actual sensor data (QA precision/recall).
- **User Satisfaction**: Citizen & planner ratings of clarity and utility.
- **Adoption Rate**: % of residents integrating assistant into daily routines.
- **Behavior Change**: Reduction in energy use, traffic peak load smoothing, improved waste recycling metrics.

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7. Assumptions to Validate

- Citizens will act on LLM-generated sustainability suggestions.
- Granite LLM can reliably interpret multimodal urban data (visuals, time-series).
- RAG pipeline provides up-to-date and accurate contextual responses .
- Existing channels (WhatsApp, municipal app) support chatbot integration.

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8. Next Steps

- **Prototype** a chat AI using **Granite 3.3B** via Watsonx.ai newsroom.ibm.com+10github.com+10linkedin.com+10.
- **User tests** with residents and city officials on real-time alerts and explanations.

- **Measure** usage, satisfaction, and behavioral indicators (e.g., energy savings).
- **Iterate** based on feedback: refine triggers, expand vision model training, improve RAG reliability.
