Problem Definition & Design Thinking

Title: AI-EBPL Urban Planning and Design Optimization System

Problem Statement:

Urban planning faces growing complexity due to population growth, climate change, and increasing demands for sustainability. Traditional planning methods often lack responsiveness, integration of real-time data, and predictive capabilities. There's a pressing need for smarter, adaptive urban design tools that incorporate AI for better decision-making and resource allocation.

The problem is how to leverage Artificial Intelligence and Evidence-Based Planning and Learning (EBPL) to make urban planning more efficient, sustainable, and inclusive.

Target Audience:

Urban planners and city architects

Municipal governments and smart city developers

Evironmental and infrastructure agencies

Academic and research institutions

Citizens and community groups

Objectives:

Develop an AI-EBPL framework to support data-driven urban design decisions

Optimize land use, zoning, traffic, green spaces, and infrastructure placement

Enhance citizen participation using AI-generated simulations and predictions

Improve resilience and sustainability in city development

Design Thinking Approach:

<u>Empathize:</u>

Urban dwellers, planners, and officials face:

Overcrowded housing and poor land use

Inefficient transport systems

Limited access to community services

Environmental degradation and lack of green zones

<u>Key User Concerns:</u>

Transparency and trust in AI-generated plans

Inclusivity for underserved populations

Balance between development and environmental conservation

Define:

An AI-EBPL system should analyze diverse data (e.g., demographics, traffic, climate, land use) to:

Predict urban growth and housing demand

Optimize placement of public infrastructure

Simulate urban development scenarios

Recommend policy interventions and zoning updates

Key Features Required:

AI models for population, traffic, and infrastructure forecasting

GIS integration for spatial analysis

Scenario simulation and visualization tools

Community feedback platforms

Compliance with urban policy and planning regulations

Prototype:

A prototype system could include:

Interactive 3D urban map with editable zones and features

AI engine that suggests development layouts and assesses impact

Public input module for feedback on planning proposals

Key Components of Prototype:

GIS and urban database integration

AI/ML model for predictive urban growth

Visual planning interface with real-time metrics

Feedback loop for community engagement