# IMPACT OF ENVIRONMENTAL ENERGY FACILITY PLANNING AND DESIGN ON ENERGY MANAGEMENT IN URBAN DEVELOPMENT

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Abstract: The development of the urban environment by providing favorable and secure conditions to the population are always directed based on the Environmental Energy factors at various level. The role of environment facility planning and development remains an integral part of designing an efficient Energy management in urban development . In this paper, the Hierarchical Statistical Efficient Planning Framework (HSEPF) has been proposed for Energy management in urban development and transportation management in urban areas. The proposed HSEPF utilizes the mathematical model for the analysis of transportation in urban areas. The proposed HSEPF focuses on designing and developing effective urban policies to improve territorial utilization efficiency and enhance Environmental Energy resources effectively. The planning has been prepared based on the ecological information in the urban region. Further, effective urban policy resolves several Environmental Energy planning and development challenges in the urban area. This paper explores the impact of Environmental Energy factors in urban territory design and management. The proposed HSEPF method experimental results show a high-efficiency ratio of 97.8%, the performance ratio of 98.7%, reliability ratio of 96.4%, and reduces the transportation congestion ratio of 15.2%,

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cost utilization ratio of 12.3% in urban Environmental Energy facility management compared to other methods.

Keywords: Environmental Energy Resources, Ecological Processes, Transportation management, Hierarchical Statistical Efficient Planning Framework (HSEPF).

## 1. INTRODUCTION

Urban planning is a scientific and political mechanism focused on creating and designing land use and the built environment, including air, water, and facilities, such as travel, communications, and delivery networks, which migrate into and out of urban areas [1]. Urban planning is a central aspect of the revived urban government model that encourages local democracy, engagement, inclusion, openness, and transparency to guarantee inclusive urbanization and spatial efficiency [2]. The urban study analyzes how urban conditions shape global interdependency and local spaces [3]. It underlines the importance of cities for the organization of economic, social, and cultural events that define and change humankind's experience [4]. City leaders should use strategic sustainability as a valuable tool for promoting economic growth [5]. Planning aims to optimize local budgets by advising investment in facilities and programs, align growth demand with the need to protect the environment [6]. A flexible framework takes a large view of the Environmental Energy sustainability of urban areas. It notes all Environmental Energy consumption effects and calls for various policies, practices, and resources to be implemented [7]. The strategy's goal is to help grow a community or city to encourage its current and potential residents' well-being by constructing comfortable, equitable, secure, productive, and desirable environments [8]. Sustained development and expansion of urban regions concern a sustainable future, mainly where the increased poverty, malnutrition, energy use, and biodiversity losses in cities can not be adequately tackled on their borders [9].

Successful Energy management in urban development strategy satisfies urgent demands while aiming to accomplish the city's distinctive vision of the future [10]. Urban planning ensures that their effect is valuable, desired, and enduring by developing a roadmap and moving for a holistic perspective [11]. The positive outcomes of urbanization include growing jobs, scientific and infrastructural developments, enhancing transport [12] and communication, improving educational and health services' efficiency, and improving living standards [13]. The Environmental Energy facility in urban planning, the dynamics of nature, and society's varying needs and expectations offer a range of concerns to ecological planning and decision-making [14]. They are planning the Environmental Energy facility concerning (i) Social and economic growth. ii) Energy management in urban development iii) regional growth. iv) Conservation of natural resources & integrated use of land. v) Structures of utilities. (vi) Structure for governance [15]. The Environmental Energy facility's benefits in urban area development are higher in neighborhoods, with more space being used successfully. More residents are living on the same square miles of land in remote areas [16]. A reduction in carbon emissions per person is another Environmental Energy benefit in cities over rural areas [17]. Transportation management is a crucial consideration in the planning and designing Environmental Energy facilities in Energy management in urban development [18].

Transport management is an essential aspect of urban growth and planning. Urban regions are fast-growing globally, and urban communities are still growing [19]. Urban planning primarily influences how a community encourages business development and whose

transport management plays a key role. The distinguishing feature of urban transport is moving people and goods to deal with this density [20]. The volume and cost of delivering connectivity in built-up environments pose problems in urban transport. Energy management in urban development has a significant effect on the business activity that a city promotes and transportation management [21]. City transportation affects a great degree of per capita spending and wages, and the GDP of region management of urban transport and safe infrastructure reduces freight costs [22]. One of the main advantages of transport management is to minimize freight costs and to track deliveries in real-time with growing customer support [23]. Urban transport authorities are faced with difficulties in the operation of vast fleets of vehicles and a rising workforce regarding repair costs. Organizations must prepare their employees for safety and injury prevention [24].
The main contribution of the paper is

- To proposed Hierechical Stastical Efficient Planning Framework (HSEPF) has been proposed for Energy management in urban development .
- Designing the urban policy operative to Environmental Energy planning and development tasks in the urban area.
- The experimental result has been performed; the proposed method utilizes the mathematical analysis of transportation in urban areas and addresses Environmental Energy influences on the nature and maintenance of urban environments.

The paper's remainder is discussed as surveys: Sectors 1 and 2 discussed the overview of urban planning and development with transportation management. In Sector 3, the Hierarchical Statistical Efficient Planning Framework (HSEPF) has been proposed. In Sector 4, the experimental results have been analyzed. Finally, Sector 5 concludes the exploration paper.

## 2. Literature review:

Yongjiu Feng et al. [25] introduces the cellular automata modeling framework (CAMF) for urban growth incorporating statistical and heuristic methods. To demonstrate the efficiency of URBAN CA, they use an artificial bee colony ( ABC) model in Shanghai, China, to simulate previous urban trends and estimate future scenarios. The findings show that Urban CA is equivalent in precision and shift simulations to CA-Markov, and greater than CA-Markov in terms of the driver's ability to describe the modeling results under various scaling conditions. Compared to current CA software sets, Urban CA gives more options. The models are readily measured elsewhere to simulate complex urban expansion and analyze the resulting natural and sociological consequences.

Dachuan Zhang et al. [26] discussed the Dilenation Of Dual Environmental Energy Evaluation Urban Growth Boundaries (DEE-UGB) and cellular automata for problematic ecological environment areas. This paper will implement the CA model for future land-use modeling by integrating this dual-Environmental Energy evaluation with a CA model for future UGB concept. This model was applied in Chungking, China, to prepare for potential UGBs. Using different landscape metrics, the DEE-UGBs can now handle urban patches by aggregation after quantifying and comparing the proposed UGB with other UGBs of Chungking. By integrating them, they simultaneously reconcile the contradictions among land uses.

Wei-Ming Wang et al. [27] introduced the fuzzy multi-criteria decision analysis (FMCDA) for Urban Sustainable Development. The Life – City assessment is a complex issue with FMCDA (fuzzy Multi-Criteria Decision Analysis). This research builds the dimensions of urban QOL growth and the potential effect factors. In screening evaluation criteria and

developing the overall evaluation framework, the Fuzzy Delphi method is used. The findings will turn the abstract definition of sustainability into a life-city appraisal and serve as a guideline for self-examination of established status and potential implementation of policies.

Eleni Feleki et al. [28-29] suggest the Indicator System for Characterization of Urban Sustainability" (ICARUS). And a Holistic methodological framework for the characterization of urban sustainability and strategic planning. People's knowledge and social competence in making decisions and the multiplying impact of decisions on climate, applicability, and funding availability are criteria that must be weighed before decision-making takes place. The new research presents an "Indicator System for Characterization of Urban Sustainability" (ICARUS)and is a sustainable development system for a city. The report addresses the urban Euro-Mediterranean contexts that interact with sustainability pillars from an eco-systemic perspective uniquely. It is planned to help the adoption of the sustainable development agenda.

The existing methods' drawbacks are that CAMF is less measured by natural and sociological consequences in urban growth and Dual Environmental Energy Evaluation Urban Growth Boundaries (DEE-UGB) different urban patches metrics to quantify land use. The fuzzy multi-criteria decision analysis (FMCDA) self-examination of established status is not the proper potential implementation of policies and Indicator System for Characterization of Urban Sustainability" (ICARUS) low interact with sustainability pillars from an eco-systemic perspective in a multi-way.

To overcome all the issues, in this paper, Hierechical Stastical Efficient Planning Framework (HSEPF) has been proposed for Energy management in urban development . This paper addresses the effect of Environmental Energy influences on the nature and maintenance of urban environments.

## 3. Hierarchical Statistical Efficient Planning Framework (HSEPF)

The position of Environmental Energy planning and growth continues to be an integral part of the significant development of urban areas. Urban planning and development with ecological facilities for managing is an intricate pattern. Transport management is a critical factor for planning and constructing urban Environmental Energy facilities.

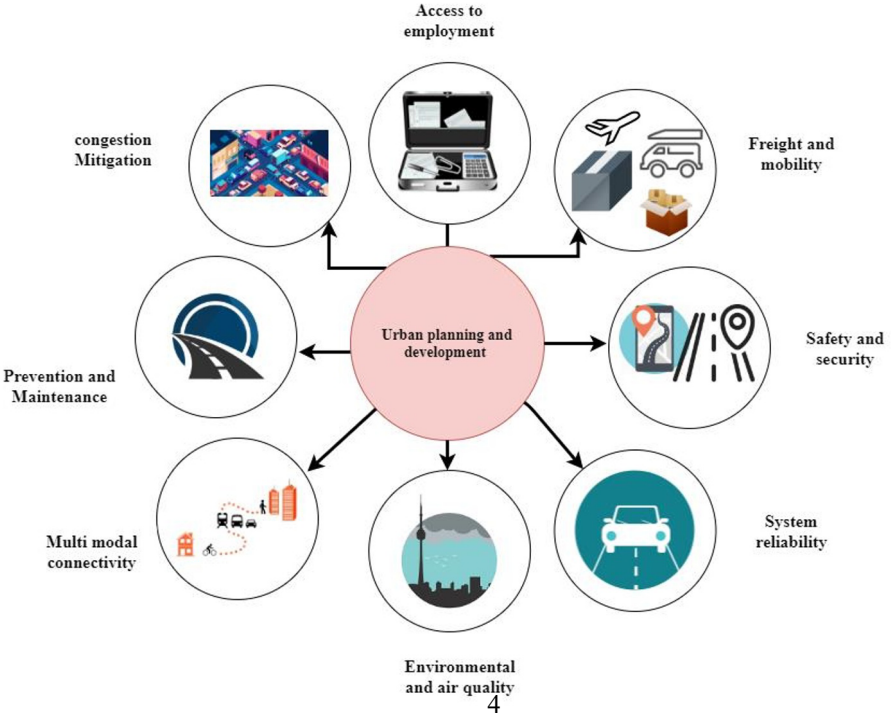

**Figure 1: Urban planning and development**

The figure1 shows urban planning and development. In the transport planning process, there are several essential priorities. The trick is to balance it when drawing up a plan which meets the goals of transport planning. Access to employment links the transit infrastructure to job growth and main business centers, concentrating on connecting with high poverty regions. Freight mobility improves freight and intermodal transport corridors to promote the flow of goods inside and from the urban area, safety, and security to increase the safety and protection of device users concerning transportation. System reliability implements technology and services aimed at improving transportation times and promoting travel in the urban region. Congestion mitigation support changes to the transportation system address current and predicted potential obstruction in the urban area's natural infrastructure. Multimodal connectivity improves the usability and connectivity of diverse modes of transport for all users of systems. Preservation and maintenance ensure a continuous state of good maintenance for current transport infrastructures and services.

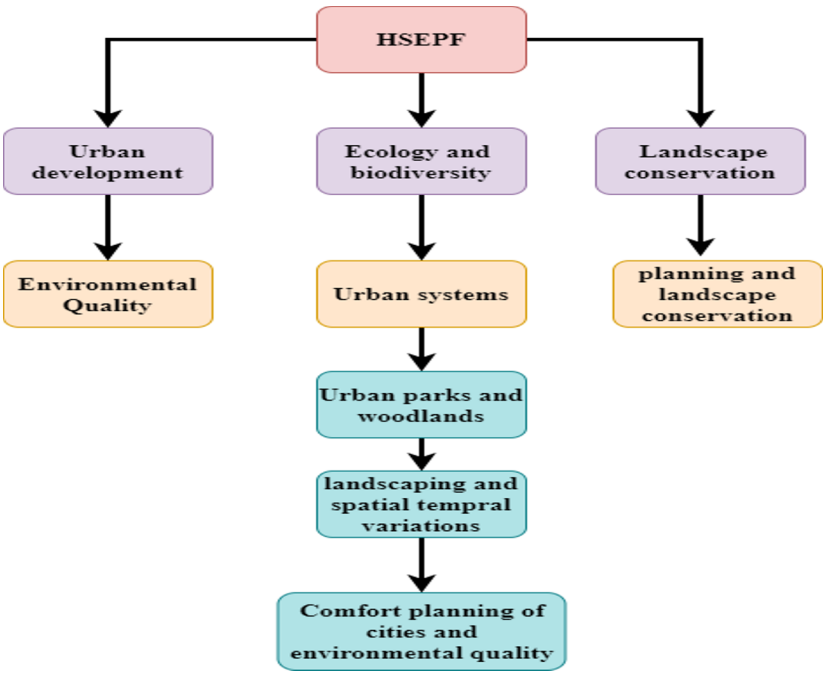

**Figure 2: Environmental Energy facility Management**

Figure 2 shows the Environmental Energy facility management. The proposed HSEPF focuses on designing and implementing effective urban policies to effectively increase territorial usage efficiency and enhance ecological resources. Planning has been prepared based on Environmental Energy knowledge in the urban area. The proposed HSEPF in the Environmental Energy facility, including Energy management in urban development , Environmental Energy and biodiversity, landscape conservation. Interdisciplinary nature and special emphasis on human and natural systems, the term "urban ecology" has been used in different ways to describe the study of man in towns, nature in cities, and the relationship between humans and nature. Environmental Energy facility management ecological Biodiversity refers to the variety of living organisms present in urban environments. It is typically measured by the number of species present in a specific city or area of the city. Effective urban planning meets urgent demands while at the same time striving to meet the city's distinctive vision of the future. The HSEPF approach to landscape conservation is typically characterized by a horizontal mechanism and a collective governance system with many stakeholders' long-term involvement. Urban Environmental Energy quality of life is a philosophy that challenges the issues of urban environments, the management of urban sprawl, and the prevention of Environmental Energy degradation. Urban parks and woodlands can be described as networks or systems comprising all forests, groups of trees, and individual trees located in urban and peri-urban areas; In Environmental Energy facility management under pure spatial variation, the variables differ across the spatial transect or are constant from one time to another. Factors that differ from time to time are consistent across the whole region under pure time variations. Any development that has been carefully designed from its inception and is usually built on previously undeveloped land is a planned community or planned area.

**Case 1: Mathematical for analysis transportation in an urban area**

**Solution 1:** This paper uses the mathematical model analysis for transportation in an urban area, and it consists of annual operating costs, annual operating income, capacity constraints. The mathematical analyses for improving the transportation facilities in urban area development. Consider an urban area divided into $k$ zone and let $H(M, L)$ be a diagram of the transportation network of modes which serves the area, with the number of nodes $M$ and the number of connects $L$. $L^v$ is the number of links moving by private vehicles, $L^a$ is the alternate form of transport links. When transit is the alternative mode of transport, the $L^a$ links are the pedestrian connection used for stopping nodes from the urban areas, line road links commuting by transit, boarding connection, and lighting connection. Alternative modes of transport in some cases are mixed, with some $L^a$ connects traveling by car: travelers moving into the central section of a city use their private vehicles to drive from the origin centers to parking areas outside the central area and then proceed to their final destination on foot or in transit. Focused on this, any public transport mode instead of private vehicles can be called the following: it may be either transit, mixed, or only compost. The following mathematical equations improve the efficiency of the system.

Each zone is identified with a centroid, and $z = (j, i) j \neq i$ the pair of centroids $z$ is the set of pairs $Z$ and $M$ is its number. The take into account the continuous state of the device over a unit period during which fixed is the total demand for transport between $\forall z \in Z$. The suppose that a car driver who drives from $j$ to $i$ follows a path to $j$ and $i$ while a public transit user chooses a hyper-path. Let as consider table 1 shows the nomenclature of the mathematical model.

**Table 1: Nomenclature**

| | |
|---|---|
| $d_z^v$ | Demand for car transport between $z$ |

| | |
|---|---|
| $d_z^a$ | Public transportation demand between $z$ |
| $d_z$ | $d_z^a + d_z^v$ |
| $Q_z^v$ | the number of paths connects $z$ by car |
| $Q_z^a$ | the number of hyper paths connects $z$ by public transport |
| $Q^v$ | the number of all paths in H travelled $z$ by car |
| $Q^a$ | the number of all paths in H travelled $z$ by public transport |
| $Q$ | $Q^v \bigcup Q^a$ |
| $N^v$ | The number of paths $q \in Q^v$ |
| $N^a$ | The number of paths $q \in Q^a$ |
| $N$ | $N^v + N^a$ |
| $g_q$ | The flow on the path of hyper path $q \in Q$ |
| $g$ | The hyper paths and vector flows on all the paths $q \in Q$ |

Demand for vehicle transport between z is calculated:

$d_z^v = \sum_{q \in Q_z^v} g_q \quad d_z^a = \sum_{q \in Q_z^a} g_q \, \forall z \in Z \quad (1)$

As shown in Equation 1, demand for vehicle transport. The transportation system demand set is in Equation (2):

$\varphi = \{g: g \in o^N, g \geq o, \sum_{q \in Q_z^v} g_q \quad + \sum_{q \in Q_z^a} g_q \forall z \in Z \; (2)$

As inferred from Equation 2, where the transportation set is depicted. A vector of attributes, $y_z^v$ and $y_z^a$ , respectively, describe the two transport modes connecting $\forall z \in Z$. These vehicles' sections are the different components of the economic cost of transport (car rates, road prices, transit fees, etc.) and the various transportation (in-car time, wait time, and time on foot). The structural instruments $c_z^v$ and $c_z^a$ are linear functions of $y_z^v$ and $y_z^a$ about all modes of transport$\forall z \in Z$:

$c_z^v = \eta' y_z^v \quad c_z^a = \eta' y_z^a \quad (3)$

As discussed in equation 3, where structural instruments have been denoted, $\eta'$ is a coefficient vector and 'means a vector translation. When$-\sigma$, a factor in the running costs of the vehicle, in Equation. (4) it is possible to write:

$$c_z^v = -\sigma s_z^v \quad c_z^a = -\sigma s_z^a$$

$$s_z^v = -\frac{1}{\sigma} y_z^v \quad s_z^a = -\frac{1}{\sigma} y_z^a \quad (4)$$

As introduced in equation 4, the vehicle running cost has been represented. The cost of a general journey between $z$ on both modes of transport in monetary units is expressed. If Weibull variables are separate by the random residuals of the utility, $d_z$ demand splits between two modes of transport according to the logistic model follows in Equation (5):

$$d_z^v = d_z \frac{\exp(-\sigma s_z^v)}{\exp(-\sigma s_z^v) + \exp(-\sigma s_z^a)} = \frac{d_z}{1 + \exp[\sigma(s_z^v - s_z^a)]}$$

$$s_z^v = s_z^a + \frac{1}{\sigma} In \frac{d_z - d_z^v}{d_z^v} = s_z^a + \mu_z(s_z^a) = s_z^a + \Delta_z(g)$$

$$\mu_z(d_z^v) = \frac{1}{\sigma} In \frac{d_z - d_z^v}{d_z^v} \Delta_z(g) = \frac{1}{\sigma} In \frac{d_z - \sum_{q \in Q_z^v} g_q}{\sum_{q \in Q_z^v} g_q} \Delta_z(g) \quad (5)$$

As finding an equation 5, the logistic model has been indicated, and users presume that the whole of the urban transportation system is controlled by an authority that regulates the system by a collection of decision variables composed of freight transit rates, frequencies of transit facilities, and path prices based on specific car connects with the configuration of transit lines and a car traffic schedule.

The scheme must face some of the restrictions: technical and Environmental Energy capability limits of the vehicle system, technical capabilities limitations of the rail system, financial constraints of an entire urban transport system, and the balance limit of flows passing across the bimodal network. This equation to find them Environmental Energy facility management reliability.

Let's consider $O$ be the vector of price prices on the paths, $\pi$ the vector of the transit fares, $v$ and the vector of the transit line service frequencies. This equation to improve the performance of transportation in an urban area. The decision parameters vector $y$ in Equation (6):

$$y = (\grave{o}, \grave{\pi}, \grave{v})` \quad (6)$$

As inferred, equation 6 calculates the decision parameters, the set of non-negative $y$ values that allow all restrictions to be met is the viable set of variables for decision. Therefore it sets the vector $y$ values, $\bar{y}$ which enhances a specific objective function, for its authority of the urban transport system.

Even consider the transport sector's conduct over a unit period in which overall transport needs are stable. The spending restrictions apply to a year, and the expenses are calculated by both public and private bodies over a year. $O^x$ The transport sector is the annual operating revenue collected on private cars through transit and road rates.

Cars crossing the cordon across the city's central part or parking fines will be paid path rates at the target areas. The first case is a supplemental expense to the car ties that cross the cordon; in the second case, the extra costs to the connectors converging on the destination core are attributed. This equation analyses cost utilization in transportation management. The ticket price shall be available to the ties linking the network's pedestrian nodes to the bus stations. Let $J$ be the set of relations that apply to the route prices and $I$ be the list of links that apply to the ticket prices. The respective values of road pricing and ticket pricing set by the authority that administers the scheme shall $o_j$ and $\pi_i$ $the$ $e_j$ & $e_i$ be the number of flows for connectivity $j \in J$ and$i \in I$ are considered in the Equation (7):

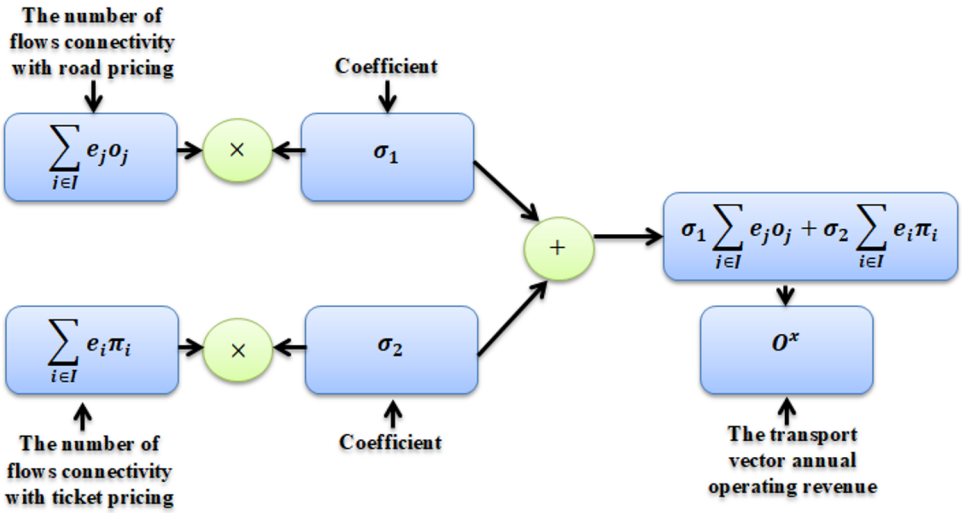


**Figure: 3 The transport vector annual operating revenue**

$$O^x = \sigma_1 \sum_{j\in J} e_j o_j + \sigma_2 \sum_{i\in I} e_i \pi_i \qquad (7)$$

Figure 3 and equation 7 shows the transport of annual operating revenue. Where $\sigma_1$ listed as $\sigma_2$ listed are two coefficient, which turns unit time revenue to annual revenue. The annual cost of operations $v^x$ is the amount of the cost of transit administration, the role $\varepsilon(u)$ of the frequency of service vector $v$ and the cost to receive payments from road users, which is meant to be proportionate to the amount of the flows $e_j$ for connections $j \in J$ is considered in Equation (8):

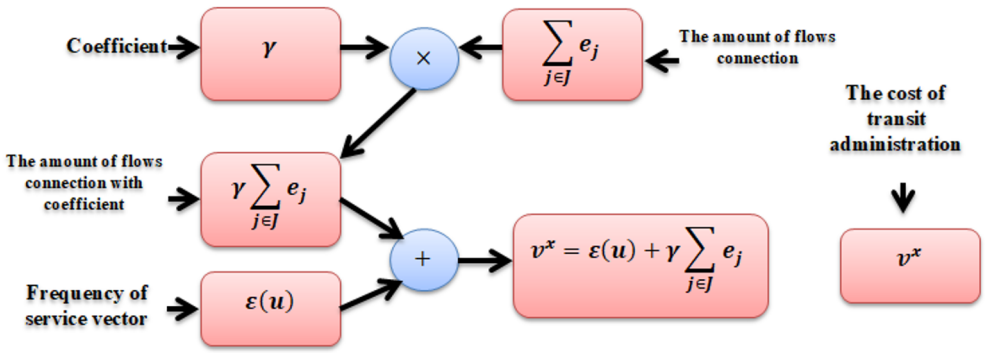


**Figure: 4 The cost of transit administration**

$$v^x = \varepsilon(u) + \gamma \sum_{j\in J} e_j \qquad (8)$$

As found in equation 8 and Figure 4 shows the cost of transit administration. In equation 8, $\gamma$ is a coefficient. The transport system's annual deficit, $D$, is the annual difference between $v^x$ and $O^x$ calculated in Equation (9):

$D = v^x - O^x$ (9)

As shown in equation 9, transport systems' annual deficit has been found. If public funds support financing the transport system, $D$ may be optimistic. When available, funding does exist. In comparison, if $D$ is negative, $O^x - v^x$ For example, it may be used to enhance the infrastructure of road transport, to increase the pity's central sector's parking capacity

Let $A$ be the public funding annual, and $B$ the upper bound imposed on the amount the planning authority can extract from the transport system revenues every year to improve the road system for political reasons following in Equation (10):

$D \leq B \quad -D \leq A$ (10)

As derived in equation 10, the road system's political impact has been analyzed. The network $\delta$ is subject to capacity limits related to the interactions between path prices and linear functions of flows on those interactions in Equation (11):

$\sum_{j\in J} \gamma_{o_j} o_j - G_o \leq 0 \qquad 0 \in (1{,}2 \to \delta)$ (11)

As inferred in equation 11, the interaction of path prices and a linear function is examined. The sum of the two terms is usually $G_o$: the $G_o^0$which is calculated by the actual capability of the transport system and the $G_o$ the value which is obtainable by the transportation management system. Based on this equation, transportation congestion has been identified and reduced. Table 2 shows the transportation management system symbols. The optimistic dividend between the public funding $A$ and the budget deficit $D$ should be equal to the available financing in Equation (12):

$\Delta G_o = \theta\delta_o(B - D) = \theta\delta_o[B - \varepsilon(u) - \gamma\sum_{j\in J} e_j + \sigma_1\sum_{j\in J} e_j o_j + \sigma_2\sum_{i\in I} e_i\pi_i$ (12)

As shown in equation 12, the transportation management system. Where $\theta$ =1 if $A - D \geq 0, 0$ otherwise and¨$\delta_o$ is a constant, that is the characteristic of any constraint in Equation (13) :

$\frac{e_j}{u^s} = A^s \leq 0 \forall i \in I^s, \forall s \in S$

(13)

**Table 2: Transportation management system symbols.**

| | |
|---|---|
| $S$ | The number of transit lines |
| $A^s$ | The capacity of a transit vehicle traveling online $s \in S$ |
| $I^s$ | The number of connects travelled by line $s \in S$ |
| $u^s$ | The frequency of connects $s \in S$ |
| $e_j$ | The connected on flows $s \in S$ |

The proposed Hierarchical Statistical Efficient Planning Framework (HSEPF) and mathematical model achieve high performance, efficiency, reliability, and minimize cost utilization and transportation congestion.

## 4. Results and discussion

The proposed HSEPF method experimental results have been performed based on Efficiency, Performance, Reliability, Cost utilization, and Transportation congestion.

**i) Efficiency ratio**

Their transportation systems' efficiency and their insights into their urban transport strategies employ the mathematical model to analyze transport facilities in the urban area. To decide the quality of transport systems, availability, affordability, quality, convenience, and sustainability are the main factors affecting urban transport. The solutions have been proposed in this study that can solve transport problems. Figure 5 shows the Efficiency Ratio. The experimental results show the urban policy to improve urban transport management in an urban area.

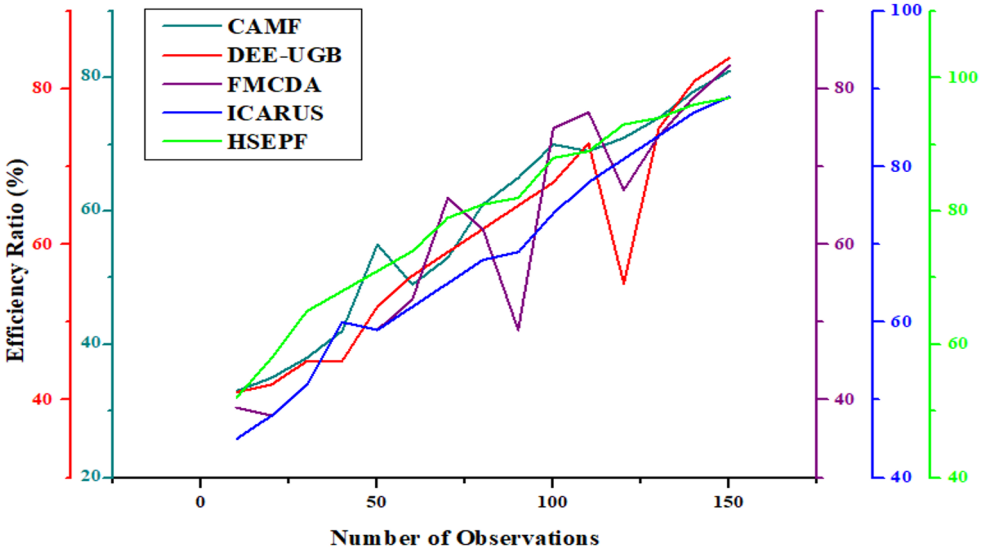


**Figure 5: Efficiency Ratio**.s

**ii) Performance Ratio**

The proposed method provides efficient urban policies to increase territorial usage quality and to improve Environmental Energy services effectively. Mathematical model analysis of the dynamic behavior and relationship between the transportation system and land use transport Planning for Urban Areas. This model analysis allows new generations of transportation planners to provide accurate forecasts of urban travel phenomena at different analysis scales. This analysis to reduce Environmental Energy consumption based on land use of transportation. Figure 6 shows the Performance Ratio of proposed method when compared to other existing methods.

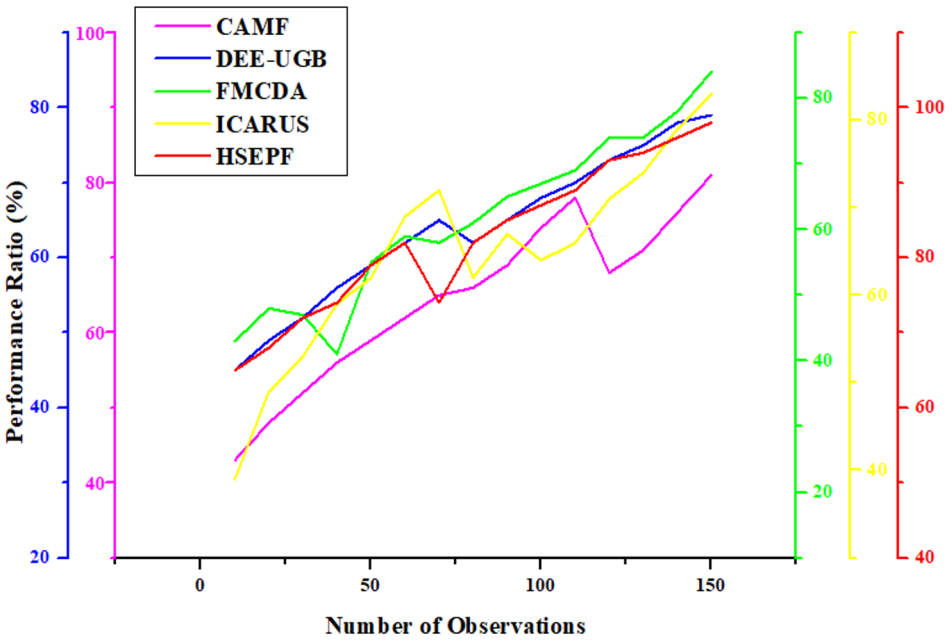


**Figure 6: Performance Ratio**

**iii) Reliability Ratio**

This paper uses urban policy in Environmental Energy planning and development to reduce the urban area's challenges to improve its efficient use of Environmental Energy resources. Urban planning policy and creation of urban areas ensure that its impact is valuable, desired, and enduring by creating a roadmap and the transition towards a holistic perspective. The reliable positive effects of urbanization involve job development, scientific and infrastructural development, transport and connectivity, education and health services quality, and change. Table 3 shows the Reliability Ratio. The experimental results demonstrate a reliable environment facility when compared to conventional techniques such as CAMF, DEF-UGB, FMCDA, ICARUS, HSEPF.

**Table 3. Reliabilty Ratio Analysis**

| Number of Observations | CAMF | DFE-UGB | FMCDA | ICARUS | HSEPF |
|---|---|---|---|---|---|
| 25 | 65.5 | 68.6 | 73.4 | 75.6 | 78.6 |
| 50 | 70.4 | 76.5 | 80.5 | 83.7 | 88.5 |
| 75 | 74.3 | 76.8 | 83.2 | 87.7 | 89.3 |
| 100 | 69.3 | 72.7 | 78.6 | 82.8 | 86.6 |
| 125 | 83.8 | 85.5 | 87.3 | 89.2 | 90.3 |
| 150 | 83.3 | 87.6 | 90.6 | 93.2 | 97.6 |

**iv) Cost utilization Ratio:**

In this paper, the urban policy effectively improves territorial utilization and enhances environment facilities in urban areas. Urban policy to enhance the Energy management in urban development and planning system is a prerequisite for the modernization of urban areas, and urban policies that take steps to fix individual defects from time to time triggered by unreasonably disruptive outdated accidents. The decision-making to be modified the urban area, from hierarchical processes to more dynamic systems requiring engagement, surveillance, and assessment, which will help decision-makers better understand the effects of their decisions to minimize public institution costs, limits opportunistic activity, and verifies it if it is not possible to remove it. Figure: 8 shows the cost utilization Ratio. The experimental results show the decision process to minimize urban planning and development costs compared to other methods.

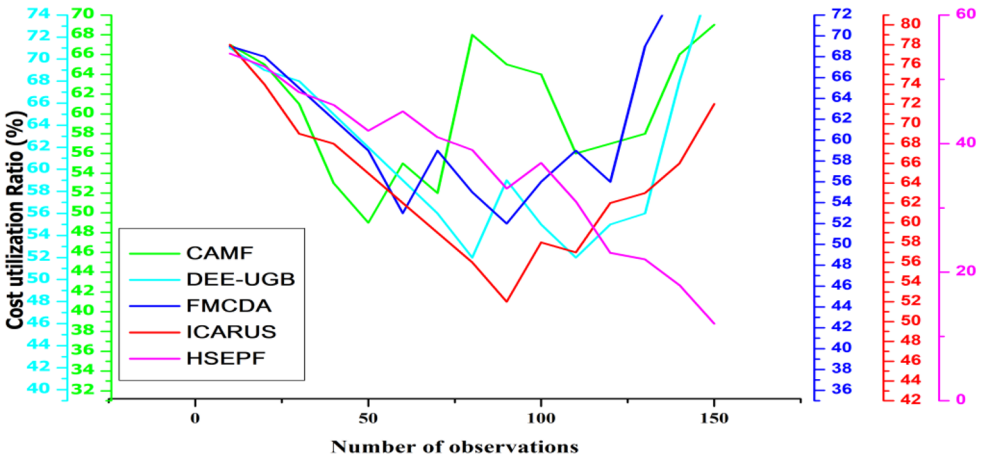


**Figure 8: Cost utilization Ratio**

**v) Transportation Congestion Ratio:**

This paper discusses the proposed HSEPF focusing on transport planning, and land use explores the management of transportation and urban policies of both supply and demand practices, and considers the best-suited way to meet indirect travel demand. The HSEPF to the opportunity to absorption of demand using the renaissance of streets as a means of

relief. The balance of housing indicates a return to suburban areas of manufacturing activities and the appropriate availability of different space/habitation choices to handle traffic in the workplace. The HSEPF approach is introduced as a multiplex destination to facilitate street access to scattered everyday needs, and as a way to decrease non-commuting traffic. Figure 9 shows the Cost utilization Ratio. The HSEPF approach recommended for better implementation of transportation management as compared with other approaches.

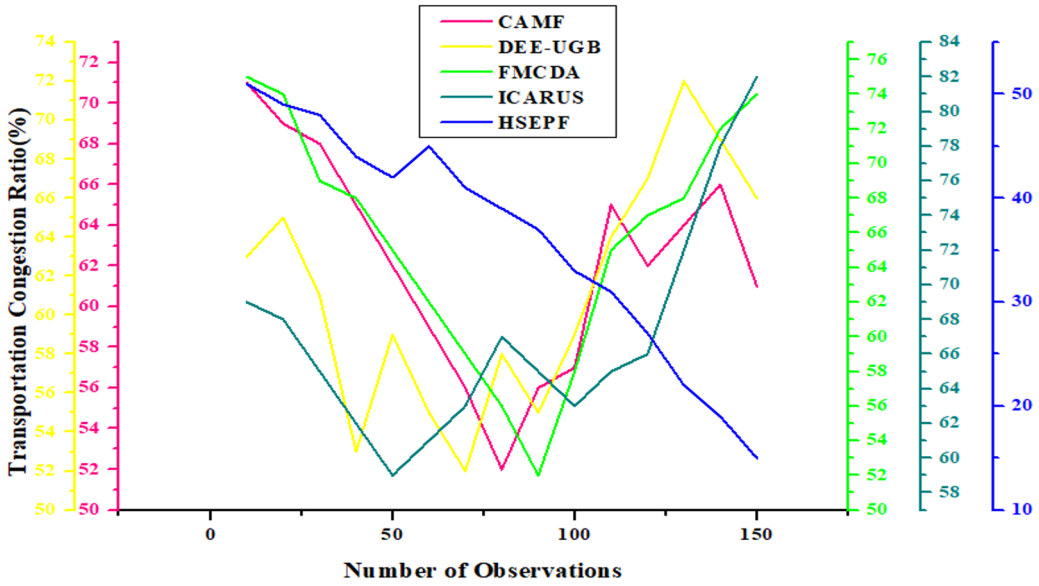


**Figure 9: Transportation Congestion Ratio**

The proposed IoT-ELEM method experimental results have been achieved high Efficiency, Performance, Reliability, minimizing cost utilization and transportation congestion when compared to other existing cellular automata modeling framework (CAMF), Dual Environmental Energy Evaluation Urban Growth Boundaries (DEE-UGB), fuzzy multi-criteria decision analysis (FMCDA), Indicator System for Characterization of Urban Sustainability" (ICARUS) methods.

## 5. Conclusion

The development of the urban environment through healthy conditions for the community is often driven at various levels by Environmental Energy factors. Urban planning and development to create significant social, economic, and Environmental Energy shifts that provide a balanced climate, with the ability to allow better use of energy, more balanced land use, and the conservation of natural habitats' biodiversity. The Energy management in urban development and planning are necessary to concentrate the environment facility management and effectively improve the urban area.The proposed HSEPF uses urban policies to create the decision-making process to reduce urban areas' challenges to improve Environmental Energy facility resources, and enhance urban areas' development. Thus, the proposed HSEPF method experimental results show a high-efficiency ratio of 97.8%, the performance ratio of 98.7%, reliability ratio of 96.4%, and reduces the transportation congestion ratio of 15.2%, cost utilization ratio of 12.3% in urban Environmental Energy facility management compared to other methods.

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