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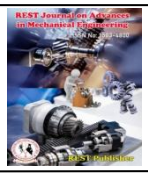

Evaluating sustainable transportation systems using Weight Product method

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Abstract: In the number of traffic operations over the years there has been an unexpected development and this In the coming years The trend is expected to continue. It is like air pollution and noise associated with environmental costs; it is in modern cities Reduces quality of life. To deal with this crisis, Municipal governments invest in sustainable transport systems; they are efficient, powerful and not only are they economical, they are also environmentally friendly. To effectively manage resources and air pollution in cities, Consistent traffic planning is essential to reduce noise and congestion. In this paper, for sustainable transport planning Simulation-based to identify key determinants we present an optimization approach. of a sustainable transport system as the objective of future research in different contexts WSM can be considered for more detailed analysis. Key implications for policy makers and stakeholders in cities Improving public transport is a sustainable activity it is done by considering various dimensions.
Keywords: Sustainable transportation systems, WPM (MCDM) Method

1. Introduction

Sustainable transport systems play in the economic development of a country plays an important role and human settlements. For example, static transport defines a static transport system. Inter generationally, (2) supports affordable, efficient, modal choice and a vibrant economy; (3) Controls emissions on the planet and absorbs and wastes them, of non-renewable resources reducing consumption, It reuses its components, recycling and conserves land. Reduces application and noise generation. One way to consider sustainability in regional transportation planning is to: (1) Corresponding to metropolitan area Identifying sustainability issues and regional sustainability goals, (2) Defining relevant performance measures and goals based on predetermined issues of sustainability of the transportation system, (3) develop alternatives for the region. Sustainability implications of transportation and land use scenarios Analyzing and measuring, 4) Using Multiple Criteria Decision Making (MCDM) theory Developing a Composite Sustainability Index (CSI), and (5) more sustainable (or at least unsustainable) sustainability objectives than previously determined. Visualization of sustainability indices using a decision support tool for project identification the aim of this thesis is to analyze sustainable transport policies exploring the potential Current in India Travel Demand Modeling Approaches and recommending further improvements in the modeling approach. Typical in Indian cities briefly reviews urban transport issues. Review intervention Stable in urban traffic environment Transport policy. Travel Demand Modeling Approach and Sustainable Transport Policies in India Focuses on analytical skills. Based on a functional approach that focuses on basic inputs, model components and outputs Reviews developed travel demand modeling approaches. Travel behavior and activity-based studies in the Indian context and based on the needs identified from the conceptual activity-based review Focuses on the travel demand model framework. The final section summarizes our study. For these reasons, various sustainable transport policies there is still no unified framework for defining and evaluating. For such multifaceted problems, Flexible, careful and iterative choices are required.

2. Sustainable transportation systems

Sustainable growth is in the Brand Land report "Future generations have their own needs without compromising the ability to fulfill Development to meet current needs" is defined. Sustainability has three dimensions widely recognized for: Environmental, social and economic sustainability. About sustainable development, sustainable transport researchers based on research, it's the policy makers and from career coaches received much attention. The concept of mass transit is static Evolved from development. The former is environmental issues and Focuses on resource scarcity, the latter includes society and economic interests above and beyond. The latter is preferable because it is of the transport sector Allows people to consider all implications in detail and for stationary transport Encourages people to seek integrated solutions. A sustainable traffic estimation method, Develop observable a beneficial quality of existing assessment methods it also tries to address their shortcomings. Implementing a sustainable transport assessment system, during the planning, design and construction phases, Degree of sustainability of transport projects and quality assessment established Relies on multiple criteria techniques. PROPOSED ASSESSMENT METHOD This is for transport project selection can augment the traditional environmental analysis performed. A wide range of issues to consider in a manner that can be easily implemented by

stakeholders this method is designed to be flexible. Leadership in Energy and Environmental Design Green Building Certification Design of a building, To determine sustainability of construction and maintenance Although an internationally recognized standard, To evaluate sustainable transport projects There is no officially accepted method. In fact, the evaluation of transport projects is often An assessment of construction impacts or a benefit-cost analysis that concludes by comparing alternatives, Defined by the need to determine cost implications. Our current transport system is not on a sustainable path. Some of our commendable achievements in terms of movement are substantial have come at environmental and social and economic costs. Environmentally friendly, socially equitable and economically viable to meet our transportation needs the challenge now is to find ways. These are the goals of a sustainable transport system.

3. WPM Methods

WPM can be used for both one-dimensional and multidimensional MCDM problems. An advantage of the method is that It can be used by relatives Converts actual values. Weighted Production Method (WPM) is similar to WSM. The main difference is that Instead of addition to WPM Multiplication is required. As with all MCDM methods, WPM is based on multiple decision criteria a described decision is a limited number of alternatives. Vertical allocation decision the problem can be expressed in matrix form. WPM is multi-attribute a decision making technique. The process of WPM is as follows. An alternative to the decision problem and identify attributes. For each attribute selected An assigned quantity or fixed value. Using the proposed technique Identified alternatives will be evaluated. For selected alternatives, the values of the selected attributes, May be based on data or estimates available to the decision maker. Beneficiary of the decision matrix and based on non-beneficiary characteristics Normalization of given data. Feed the normalized data with the corresponding weight of the attribute and multiply the variable values in the array. wj is the weight of the attribute. Alternatives are ranked based on their scores or values. WPM is called dimensionless analysis, Because of its mathematical structure removes any units of measurement. When using multiplication on attribute values No change required. Weights with each attribute values will become relevant layers. Table 1 and Table 2 show in alternative and parameter factors.

TABLE 1 alternative factor

A1	Bus transport
A2	Truck transport
A3	Two wheeler transport
A4	Car transport
A5	Auto transport

Bus transport (A1), truck transport (A2), two-wheeler transport (A3), car transport (A4), auto transport (A5) are the alternatives given in Table 1.

TABLE 2 parameter factors

C1	Accessibility
C2	Safety
C3	Reliability
C4	Quality of service
C5	Benefits to economy
C6	Usage of fossil fuels
C7	Air pollutants
C8	Operating costs
C9	Noise
C10	Waste from road transport

Accessibility(C1), safety(C2), reliability(C3), quality of service(C4), economic benefits(C5), use of fossil fuels(C6), air pollutants(C7), operating costs(C8), noise(C9), emissions from road transport(C10) are given in Table 2.

TABLE 3 given a data set

Alternatives	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**
A1	45.12	58.23	65.24	64.12	70.45	25.43	36.12	32.15	18.43	36.12
A2	64.13	42.13	57.12	54.23	65.32	35.42	12.00	24.13	26.43	42.13
A3	54.00	65.25	86.12	69.86	63.14	34.12	42.15	36.24	27.13	35.12
A4	56.32	52.43	45.36	54.76	53.42	36.43	42.15	27.68	31.42	29.54
A5	65.00	69.23	36.96	55.43	42.13	21.00	32.14	19.25	31.21	20.14

Table 3 is given The Data Set. Segment factors values is high values for the data set. Financial and economic factors are low values for the data set.

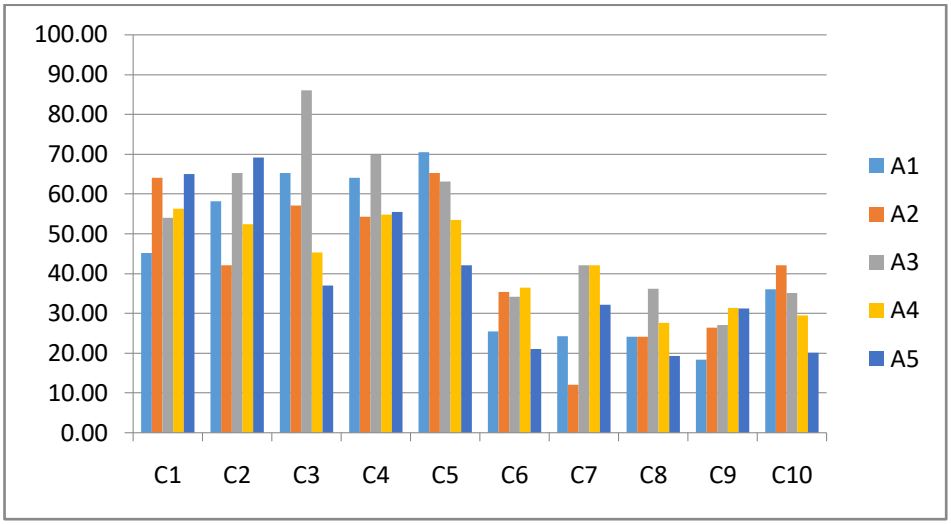

FIGURE 1 Give a data set graph

Figure 1given the data set graph is showing A3 is highest value for the graph. C1, C2, C3, C4, C5 values is high and C6, C7, C8, C9, C10 is low values.

TABLE 4 Normalized data

C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**
0.6942	0.8411	0.7575	0.9178	1	0.8258	0.3322	0.5988	1	0.557586
0.9866	0.6086	0.6633	0.7763	0.9272	0.5929	1	0.7978	0.6973	0.478044
0.8308	0.9425	1	1	0.8962	0.6155	0.2847	0.5312	0.6793	0.573462
0.8665	0.7573	0.5267	0.7839	0.7583	0.5764	0.2847	0.6954	0.5866	0.681787
1	1	0.4292	0.7934	0.598	1	0.3734	1	0.5905	1

Table 3 gives the normalized data of the data set. Given this data is easily calculated.

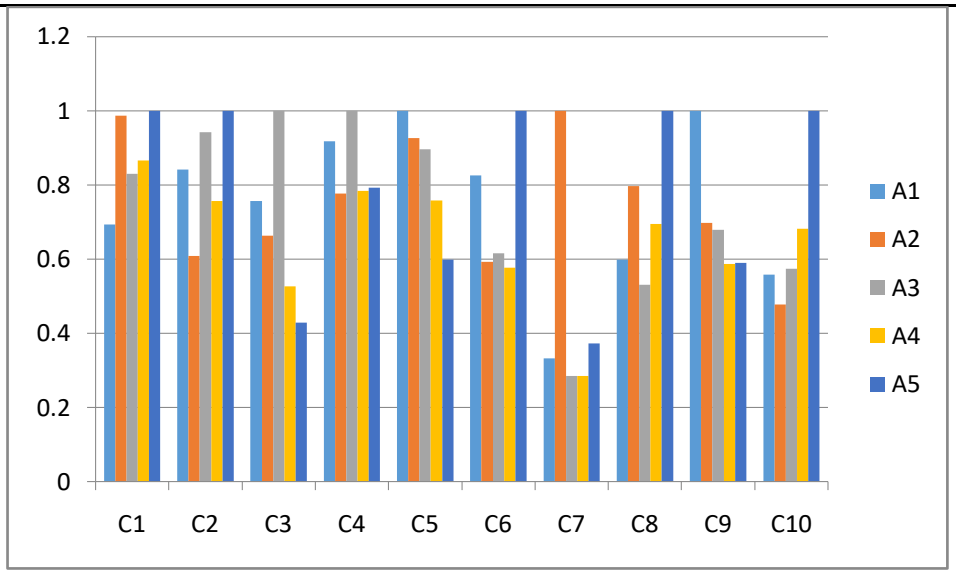

FIGURE 2 gives the normalized data

TABLE 5 gives weight matrix

	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**
A1	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
A2	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
A3	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
A4	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
A5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

Table 5 gives weight matrix all values is taken for same values

TABLE 6 Weighted normalized result matrix

	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**
A1	0.91278	0.95766	0.93294	0.97879	1.00000	0.95328	0.83907	0.94518	1.00000	0.86413
A2	0.99664	0.88323	0.90245	0.93865	0.98128	0.87749	1.00000	0.94508	0.91381	0.83151
A3	0.95471	0.98531	1.00000	1.00000	0.97298	0.88573	0.73046	0.85371	0.90786	0.87021
A4	0.96480	0.93287	0.85191	0.94093	0.93316	0.87134	0.73046	0.91320	0.87514	0.90868
A5	1.00000	1.00000	0.80939	0.94380	0.87938	1.00000	0.78169	1.00000	0.87661	1.00000

Table 3 gives the weighted normalized decision matrix of the weight. Given this data is easily calculated.

TABLE 7 Preference Score for data set

A1	0.52147
A2	0.46106
A3	0.39939
A4	0.31118
A5	0.46032

Table 4 gives the Preference Score. A5 is highest values for preference values shown in figure 3.

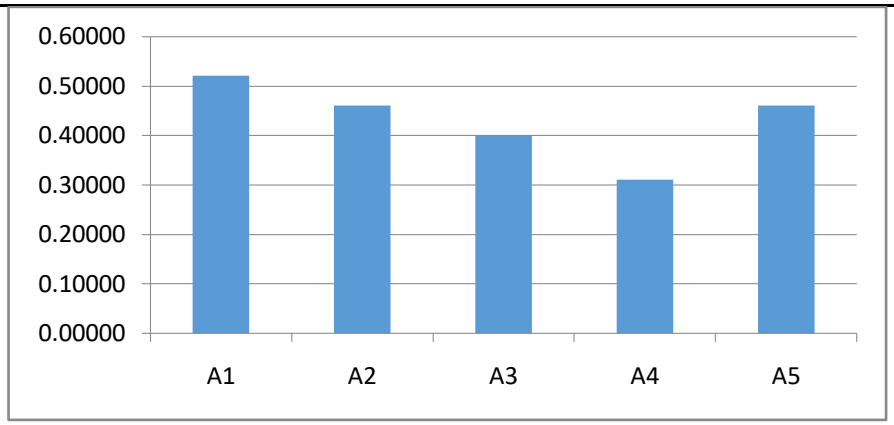

FIGURE 3 Preference values graph.

TABLE 8 Ranking

Bus transport	1
Truck transport	2
Two wheeler transport	4
Car transport	5
Auto transport	3

Table 8 shows that the Bus transport is in 1st rank and Car transport are last rank. Figure 4 shown in ranking

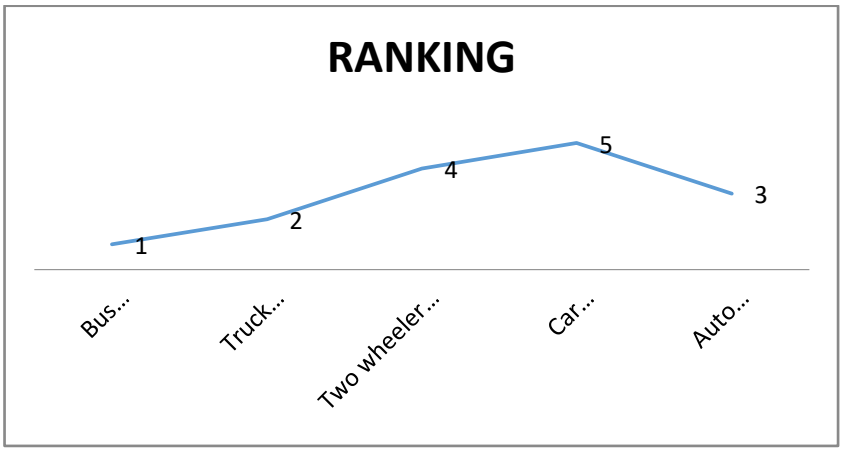

FIGURE 4 shown in ranking.

4. Conclusion

About sustainable transport previous studies are limited to the transportation system focused or incomplete, which is in the context of the problem. Does not use a method for processing ambiguous and qualitative information Increasing energy demand and because of low oil reserves Transport is the most challenging sector to achieve sustainable development. Either method is stable Traffic is not reachable and collaborative activities in the context of the energy system. Results of analysis for India, transport and operational systems both have similar growth over the years and shows that they follow a positive trend with contractions. In contrast, the ecosystem follows an inverse pattern. Of economic and transport development Periods are negative in environment is expected to result in, It seems intuitive, should be analyzed. This is increased emissions and leads to energy consumption. In general, the efficiency of the ecosystem has decreased significantly over time. Adopted to protect the system The policies have shown positive results. However, the efficacy of the environmental mental system is questionable, And long-term policies need to be developed.

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