

Developing a Standard Definition of Intermodal Transportation

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Abstract

Despite the growing emphasis being placed on intermodal transportation by government and industry, a consensus definition of intermodal transportation does not exist. The purpose of this paper is to propose a standard definition for intermodal transportation. Several definitions for intermodal transportation are presented, compared and critiqued. Themes common to this cross-section of definitions are combined with other potentially important concepts to develop a definition that captures the full scope of intermodal transportation. A thorough analysis of each element of the definition, along with reasoning for its inclusion, is also presented.

1. Introduction

The United States Department of Transportation has recently placed an increased emphasis on intermodal transportation. This emphasis is captured in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Section 2 of ISTEA states:

“It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner.

The National Intermodal Transportation System shall consist of all forms of transportation in a unified, interconnected manner, including the transportation systems of the future, to reduce energy consumption and air pollution while promoting economic development and supporting the Nation's preeminent position in international commerce.”

One impact of ISTEA has been a tremendous increase in the number of research projects related to intermodal transportation. Despite these activities, a consensus definition for intermodal transportation does not exist.

The Eno Transportation Foundation, a nonprofit organization that is devoted to improving transportation and responsible for publishing *Transportation Quarterly*, concludes that the meaning of intermodal transportation depends on the viewpoint of the definer [1]. Consequently, companies specializing in rail transport tend to classify intermodalism as a function of rail cars, while trucking companies describe it in terms of trailers. Even within specific transportation arenas, there are conflicting opinions with regard to the importance of specialized containers in intermodalism. This myriad of perspectives, according to Jennings and Holcomb [2], means “a large number of ‘definitions’ are present in the research literature, suggesting that a fundamental interpretation of this term does not currently exist”.

This paper illustrates the lack of consensus by presenting several existing definitions of intermodal transportation. Each definition is critiqued, and a new definition of intermodal transportation is formulated. This definition incorporates the strengths and common themes of the existing definitions. In addition to being a standard description for intermodal transportation, this new definition is constructed such that it can become the foundation upon which future research in the area is conducted.

2. Existing Definitions of Intermodal Transportation

Merriam-Webster defines intermodal transportation as “being or involving transportation by more than one form of carrier during a single journey” [3]. This definition contains the fundamental characteristic of intermodalism – multiple carriers during a single journey. However, the definition lacks sufficient detail to be used as a basis for intermodal transportation research. Containerization, which is considered by many to be a cornerstone for intermodal transportation, is not discussed. In addition, freight and passengers are not mentioned as the prospective entities being transported in this manner.

Norfolk Southern, a rail-based transportation provider, offers the following definition for intermodal transportation on its web site: “The movement of trailers and containers on rail cars” [4]. This definition illustrates the problem cited by the Eno Transportation Foundation with regard to intermodal transportation being characterized from the definer’s viewpoint. In addition to rail bias, this definition has another serious flaw. Only one mode of transportation, rail, is mentioned in the definition. This is a fundamental untruth, as it suggests only one mode of transportation is involved in the

container and trailer movement. The first half of the word intermodal, *inter*, suggests more than one mode is involved. This definition, therefore, should be considered inappropriate.

McKenzie, North and Smith, the authors of *Intermodal Transportation – The Whole Story* declare “the shipment of containerized cargo using more than one mode” as “the popularly accepted definition of modern intermodal transportation” [5]. This is an unbiased definition in that it is not geared toward one particular mode of transportation. In addition, the fact that more than one mode must be involved in the transport is specified. Like Webster’s definition, this definition is a good general description of intermodal transportation. It is slightly more detailed than the Webster’s definition, however, because of the mention of “containerized cargo.” This phrase implies that intermodal transportation involves containerized freight movement only (no bulk freight or passenger movement).

In a report to the US Federal Highway Administration, Norris [5] defines intermodal transportation as “a coordinated transport of goods in containers or trailers by a combination of truck and rail with or without an ocean-going link”. Jennings and Holcomb characterize this definition as being too narrow and a constraint for potential research in the area. They conducted a study to examine the role, if any, that non-containerized freight practices should have in intermodal transportation discussions. There was a distinction made between intermodal transportation with and without containers. “Because of the differences between intermodal container movements and the non-containerized method, the latter type has acquired its own terminology and name – transloading” [2]. Therefore, while Jennings and Holcomb acknowledge that non-

containered freight movement using more than one mode should be considered in intermodal research, they are careful to distinguish between containered and non-containered movement. They classify intermodal as “multimodal one-container” transportation, while transloading is classified as “multimodal non-containered” movement [2].

CNC transports, a French company specializing in intermodal transportation and logistics services, presents the following definition for intermodal transportation on their web site: “The conveyance of goods via a combination of at least two transport modes within the same transport chain, during which there is no change in the container used for transport and in which the major part of the journey is by rail, inland waterway, or by sea, whereas the initial and final part of the journey is by road and is as short as possible” [6]. This is a very detailed description of the term. It indicates that there are at least two modes of transportation involved in the movement of a container whose contents are never disturbed during the “journey”. While this definition has merit, it is a bit narrow. For instance, by specifically outlining rail, inland waterway, and sea as the modes used during most of the movement, air is excluded as a possible mode. In addition, the initial and final parts of the “journey” are assumed to be by road. While in most instances this is probably the case, there are certainly some instances where it is not. A definition should not exclude those possibilities. In addition, this definition did not specifically mention containerized or non-containerized freight. It only spoke of “goods” in general. This aspect of the definition makes it more suitable for research, as it does not have limits on the type of freight being transported.

On its web site, the United States Department of Transportation (USDOT) has definitions for both intermodal transportation and intermodalism. The USDOT defines intermodal transportation as: “Use of more than one type of transportation; e.g. transporting a commodity by barge to an intermediate point and by truck to destination” [7]. Intermodalism is defined in three different contexts.

Context 1: “. . . containerization, piggyback service, or other technologies that provide the seamless movement of goods and people by more than one mode of transport.”

Context 2: “. . . the provision of connections between different modes, such as adequate highways to ports or bus feeder services to rail transit.”

Context 3: “. . . a holistic view of transportation in which individual modes work together or within their own niches to provide the user with the best choices of service, and in which the consequences on all modes of policies for a single mode are considered. This view has been called balanced, integrated, or comprehensive transportation in the past” [7].

The DOT’s definition for intermodal transportation is too broad, as it does not contain any parameters characterizing the movement (no mention of entities being moved or a single journey). The second and third contexts for intermodalism explain the logistics and interdependence associated with intermodal transportation. The first context of intermodalism, however, is actually a suitable description for intermodal transportation. It contains containerization and more than one mode of transport, which seems to be a common theme among the definitions. This definition, however, considers an entity that the aforementioned ones do not – people. Intermodal transportation is not limited to freight. People often use varying modes of transportation to travel between locations. This viewpoint allows research in the area to be expanded without substantially deviating from the basic meaning.

The DOT's definition also introduces another concept that is not incorporated in the other definitions – seamless movement. Seamless movement is a critical element of intermodal transportation. In addition to providing movement from origin to destination, intermodal transportation is also concerned with the smooth transfer of entities between modes during the journey. Incorporating the phrase “seamless” into the definition emphasizes the importance of this concept.

3. Summary Evaluation of the Existing Definitions

Containerization is a common theme across the myriad of definitions presented. This probably stems from the origins of intermodal transportation – the movement of containerized freight. This also explains why, with the exception of the Department of Transportation's definition, the entity involved in intermodal movement was strictly limited to freight and people were excluded. With the exception of air, most of the definitions presented were inclusive regarding the modes of transportation involved. Some mentioned specific modes, while others incorporated the mode element in broader terms. The fact that these definitions are so varied and dependent on the definer's perspective confirms that there is currently no consensus definition for intermodal transportation.

4. A New Definition of Intermodal Transportation

By extracting common themes from the definitions presented and infusing ideas that should promote research vitality, the following definition could fill the void as a standard definition. Intermodal transportation should be generally defined as:

the shipment of cargo and the movement of people involving more than one mode of transportation during a single, seamless journey.

The framework of this definition is borrowed from McKenzie, North and Smith, with “containerized” being subtracted to allow for the possibility of non-containerized movement. The concept of people movement being a component of intermodal transportation is borrowed from USDOT and incorporated as well. To incorporate the element of multiple modes, the phrase “more than one mode of transportation” is used instead of specifically outlining the four common modes of transportation (road, rail, air, and sea). The phrase “single, seamless journey” is partially borrowed from the Merriam-Webster’s definition for “intermodal” [3]. This addition implies a smooth and coordinated transition between modes, which is a primary goal of intermodal transportation.

5. Conclusions

The definition of intermodal transportation proposed in this paper is unique in that it captures three important concepts related to multimodal transportation. First, the movement of people is relevant to the study of intermodal transportation. Second, all types of cargo transportation are relevant to the study of intermodal transportation. Third, an intermodal journey is a seamless journey in that transitions between modes occur smoothly with minimal delay.

Although people movement is not a common theme among existing definitions, it should be included in a standard definition of intermodal transportation. The potential benefits of coordinating the four traditional methods of transportation – road, rail, water,

and air – into a system that promotes the seamless transition of people between modes are enormous. Incorporating the human element into a meaning for intermodal transportation may provide the impetus toward the realization of such a transportation network.

Non-containerized freight movement should be included in the definition for intermodal transportation as well. Jennings and Holcomb point out that “While this type of movement may be considered by some to be routine and reflect an older, less efficient way of doing business, carriers seem to be expanding their interest in the method” [2]. The exclusion of non-containerized freight movement from most definitions of intermodal transportation probably stems from the necessity to distinguish between containerized and non-containerized movements, since many of their components and characterizations are different. The fundamental truth, however, is that if non-containerized freight moves via more than one mode, it moves intermodally. In addition, efforts should be made to promote the seamless transition of these goods between modes as well, which is the primary goal of intermodal transportation.

Finally, the concept of seamless movement should be included because the goal of intermodal transportation is to move the entity to its destination using multiple modes as efficiently as possible. The efficiency of an intermodal transportation system is likely to be a function of smoothness with which the entities are transferred between modes during the journey.

6. References

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