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SCALE DEVELOPMENT FOR MEASUREMENT OF INTELLIGENT TRANSPORTATION SYSTEMS SAFETY EFFECTIVENESS: APPLICATION IN AIRPORT APRON VEHICLES

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ABSTRACT

Today the world population is growing at a great pace. According to World Bank 2016 data, the world population is 7,442,135.58. According to UN (United Nations) estimates, the world population will rise to 11.2 billion in 2100. Again, according to the World Bank 2016 data, the urban population of the world has reached 54%. Therefore, increasing population and increasing urbanization lead serious transportation demand. In order to meet the demand for transportation, it is necessary to evaluate the limited resources in the best way. All modes of transport need to be developed in line with needs. However, construction of highways and railways is not a solution. Here, technology is put into effect, which makes human life easier every day. At the junction of technology and transportation, "Intelligent Transportation Systems" were born. The word "super" commonly used in the 20th century leaves its place to be "intelligent" in the 21st century.According to the definition of the European Commission, intelligent transport systems cover all modes of transport and provide advanced information for users and at the same time provide systems for the integration of different transport modes. According to another definition, intelligent transport systems are defined as a system that is multimodal, more secure, integrated with infrastructure and more efficient in using resources, giving system users more options.

Airport aprons are areas that include aircraft taxi roads, parking lots, hangars and roads. There are many different personnel on the airport apron. These personnel include aircraft crew, baggage handlers, marshaling officers, security, customs, catering, cleaning officers, engineers, firefighters, airline representatives, ramp workers etc. All of these personnel are working day and night shifts in very stressful environment due to high noise, dynamic conditions and time pressure. In addition to these, passengers can also be present at the apron on boarding and landing. In short, aprons are the environments in which various people work, and operate in a short period of time under huge pressure. Hence, danger, risk and insecurity are inevitable in these very stressful environments where the human factor is present. More and more permanent and sustainable measures are being designed and implemented daily against risk and danger. For the aviation sector, which is one of the sectors where technology is highly used it is expected that the safety problems in airport aprons will be eliminated by the help of technology. In this context, it is envisaged that the safety problems that can appear on the apron can be solved with more technological, smarter systems and devices.

Scale development studies are carried out either through experimental process or theoretical process. In this study, the theoretical process is studied, because of the difficulty of reaching large sample groups for experimental process. The apron safety policies, occupational health and safety regulations of the relevant international and national authorities have been examined as a first step in the development of the scale for measuring safety effectiveness of ITS. In accordance with these rules and regulations, a candidate scale form has been prepared with approximately 90 items. Candidate scale form was sent to experts on the internet and opinions of experts were collected. Content validity ratios were determined and the theoretical final form was obtained by specifying the items according to the content validity indices. The content validity ratios and content validity indices developed by Lawshe (1975) were used in the study. Lawshe technique consists of 6 phases.

a) Establishment of a group of field experts
b) Preparation of candidate scale forms
c) Obtaining expert opinions
d) Obtaining the content validity rates for the items
e) Obtaining content validity indices for the scale
f) Formation of the final form according to the content validity / index criteria

As a result, final questionnaire form was prepared. In the next stage, the vehicles used in airport aprons and the authorized personnel using these vehicles will be surveyed. The safety activity will be measured by the results from this. At the end of the work, safety related proposals will be made.

Keywords: *ITS, Intelligent Transportation Systems, Airport, Apron Safety, Ramp Safety, Scale Development, Apron Vehicle, Safety Effectiveness*

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