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Citizens` attitudes and behavior towards innovation in public sector:

the Toll Road project in Bodø

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Abstract

This master thesis is a research work in the field of public sector innovation.

It is written to give an answer to the main research question: What attitudes citizens have towards public sector innovation and how do they change behavior in relation to it (the implementation of toll ring in Bodø)? This is the empirical study that looks at individuals that are using the toll ring in Bodø.

Here I examined such definition as public sector innovation, considered articles that show similar projects and some useful information about toll road system, including some data about people's relation towards such road projects, and paid special attention to theoretical framework of people's attitudes and behavior with towards the innovation.

The survey for performing quantitative research I created myself with the help of project manager of toll ring in Bodø and my supervisor, and with regards to relevant theory. Questback platform was used to design a questionnaire, the link to the questionnaire was spread by the project manager using random sampling method and the "snowball" effect, Statistical Package for Social Sciences (SPSS) 24.0 was used to run correlation and regression analysis, and the results obtained would be helpful for both the researcher and Statens Vegvesen. There were 378 who participated in the survey, 48,6% of women and 51,4% of men.

The analysis revealed some interesting results. Most of the hypotheses based on theory were approved by the obtained results, but some did not.

Most of the respondents who use the toll road quite often are very negative towards it. They find the price for passing through expensive, and due to the price their attitudes becoming more negative. At the same time they do not switch to other transport alternatives because they have a habit of car using, and maybe they do not find any convenient transport alternative for them. And it is also important to mention that there is no alternative way for road users that is not charged. However, negative-thinkers are ready to switch to electric cars, more probably because this is the way how the toll payment can be avoided. At the same time, knowing the right reason why the toll road is introduced is not making attitudes towards innovation better, but respondents claim that their opinion would slightly change to a better opinion if there was a proper ex-ante information from the state.

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1. Introduction

This chapter represents the master thesis by observing background and the purpose of the research, research question and the structure.

1.1 Background and purpose of the research

This thesis is dedicated to the innovation in the field of public transport. This year, 2015, In October, 15th the Toll Ring (also Toll Road) in Bodø has started, which is new specifically for this city, but not new for Norway in general. Here the toll ring is considered as an innovation in the public sector because, according to Rogers (1983, p.11), idea, practice or object can be considered as innovation if it is new for an individual or another unit of adoption. The thesis examines people's attitudes towards the toll ring in Bodø. Bodø is the biggest city in Nordland, and second in terms of size in Northern Norway. Implementation of the toll road can lead to dramatic changes of transport use in general. The research was focused on individuals of Bodø, so we will see if the number of personal cars in a household will be limited, or maybe car users will use buses instead of cars, or it may happen that changes will not appear, mostly because there is no alternative way for drivers in the city: if you want to pass, you have to pay, and there is no other free road. There has been made a lot of similar researches on the issue of toll roads implementation and the possible outcomes, especially in Norway.

The purpose of the toll projects in Norway, (including the rings in the three major cities of Oslo, Trondheim, and Bergen), is to finance the main road projects, allowing them to be completed much faster than would be possible with state funds alone (Odeck and Bråthen, 1997). A lot of researches have already been made, based on the toll rings in these three cities, and this paper will contain hypotheses based on the previous works of different academics who have already made an input in this problem.

Innovation plays an irreplaceable role in people's lives. It gives a new life to the old technology or creates something new which makes people's life easier in different aspects (European Commission, 2013). Innovation can occur in different fields, and it doesn`t have to be followed by the positive feedback: controversially, innovation is often met with suspicion, it takes time for all the stakeholders to get accustomed to the new way of doing things (Bason, 2010).

It often happens that from the very beginning people are really negative about innovation because they don`t have a clear explanation of what is taking place (Odeck, Bråthen, 1997).

What is more, individuals are expected to change their behavior if they have a negative attitude (Odeck, Bråthen, 1997 & 2002; Kuester, 1999).

The topic of research is very relevant since this is a new project, the outcomes of which are still not studied and hard to be predicted, even though Norway has already experienced toll rings before. Bodø may face the unique changes, and the outcomes have to be carefully observed.

The statistical information such as traffic data is obtained with the help of Statens Vegvesen company, quantitative method of data collection will be used. What is specific about this research is that I was collecting primary data directly from the users of the toll road. For this purpose the questionnaire was designed with the help of Questback tool, and the link to it then was spread by the Statens` Vegvesen toll ring project manager. Random sampling and "snowball" effect methods were used, and in the result there were 378 people who participated in the research, 48,6% of women and 51,4% of men.

The results of the research can be very interesting since the company will understand whether this innovation is appreciated by users, if it brings value to them, and if there will be found mistakes in the process of the project implementation – this knowledge can be used in further necessary projects.

1.2 Research question

The research question can be formulated as follows:

What attitudes people have and how do they change behavior towards innovation in the public sector (the implementation of toll ring in Bodø)?

For this purpose literature dedicated to public sector innovation, theory of attitudes and behavior and similar researches in the field of transport will be studied.

1.3 Structure of the thesis

The thesis consists of six chapters. First chapter is introduction, and it consists of background and purpose of the research, research question and structure of the thesis. Second chapter "literature review" focuses on theory dedicated to public innovation and citizens` attitude and behavior and is divided into three sub-sections: innovation and innovation in the public sector, similar transport projects studied in the literature and important outcomes,

citizens` attitudes and behavior in response to innovation. The third chapter deals with research model and derivation of hypotheses. The fourth chapter is methodology is presenting research design, research context, data analysis and other relevant topics. The fifth chapter

deals with results of data analysis, correlation and regression analysis, discussion. Chapter number six concludes the whole thesis.

In this thesis 35 tables, 4 figures and one diagram can be found. Appendixes can be found in the end.

2. Literature review

2.1 Public innovation and citizens` attitude and behavior

In this section I will explain such definitions as innovation and innovation in the public sector, citizens` attitudes and behavior in terms of innovation, and also I will describe previous observations in the same area connected with similar public transport projects. To make this section easier for reading, I will divide it in three corresponding sub-sections.

2.1.1 Innovation and innovation in the public sector

Innovation is an issue of considerable significance for both public and private sector organizations (Hartley, 2005).

Shavinina (2003) used in her book the definition which was given by Schumpeter (1934): "Innovation takes place when either a new element or a new combination of old elements is introduced."

Such definitions of innovation as "new ideas that work" (Mulgan and Albury, 2003) and "novelty in action" (Altschuler and Zegans, 1997) state that in general innovation is not only the idea but also a new practice. According to Jean Hartley, some writers say that innovation is "radical" and "breakthrough" novelty, while others say that it is a spectrum from large scale dramatic to small scale incremental changes.

The definition presented by Moore et al. (1997, p.276) sounds as follows:

"Those changes worth recognizing as innovation should be…new to the organization, be large enough, general enough and durable enough to appreciably affect the operations or character of the organization".

According to Hartley (2005) and Windrum (2008), innovation can come from different hierarchical levels. They mention two types of innovation: top-down and bottom-up innovations. "Top-down" indicates innovation that goes from the higher levels of hierarchy, from ministry or top-management, for example, while "bottom-up" innovations usually goes up from employees or mid-level policy makers. Top-down innovation usually aims at general, big challenges, and is well-discussed on media, while bottom-up innovations can be a way to make smaller processes better.

Hartley (2005) states that much of the innovation literature emphasizes that innovation (for example, in technology) can be observed and agreed, even if the outcomes or impacts are still not very clear. The situation with public sector innovation can be characterized as ambiguous.

Here innovation is not obligatory a physical change – it can be a change in relationships between service providers and their users. Greenhalgh et al. (2004) suggests that innovations have to be "perceived as new by a proportion of key stakeholders"(p.40).

Public sector and changes in it is really important for economic life, social security and people's well-being.

The public sector combines a system of public institutions that correspond with people's everyday lives in myriad of ways. These institutions include political institutions and those that determine and implement laws. They give citizens such structures that provide with social welfare services, education and health. Public sector services make a big part of all economic activities – around 20 % of employment and approximately 15% of GNP (on average in Europe) (Windrum, 2008).

There exists an opinion that it is difficult to tie together public sector and innovation. Standfrod Borins (2001) mentions what he calls "traditional bias against innovation in the public sector". He looks at some common obstacles to innovation: "the lack of financial incentives; the consequences of unsuccessful innovation; and the stringent controls of central agencies". According to Vigoda-Gadot (2008), efforts to exercise public sector innovation are quite scarce. Public sector is thought to be bureaucratic, restricted and slow moving. Hartley (2005) mentioned that innovation in the public sector is thought to have a sceptical attitude and Vigoda-Gadot (2008) states that innovation and bureaucracy are an "odd couple" because of huge differences in core principles. To whatever extent public sector is changing, it is mostly thought to be the reaction on innovation from non-governmental organizations. As two possible variants for public sector innovation there are such definitions:

1. Innovation is self-defeated in conditions of classic bureaucratic models (Vigoda-Gadot, 2008);

2. Innovations are considered adopted by public sector only after developing elsewhere.

Alongside, Vigoda-Gadot (2008) states that administration literature has failed to integrate the knowledge taken from general management literature about the antecedents and outcomes of innovation.

And, what is more, the discussion about innovation in public sector was mainly based on the data from individual nations and cultures, not taking in consideration multinational and multicultural aspects which exist, for example, in Europe.

However, this is a common (mis)conception in many developed countries that public sector is not innovative. With the importance of public sector, public innovation is one of the main central topics in social welfare, productivity growth and long-term employment.

From being an interest mainly among academics, public sector innovation quickly became the focus of many politicians and middle manages or project managers who could get the idea off the ground (Bason, 2010).

To overcome the problem of connection between innovation and bureaucracy, there appeared a new approach which became really famous among academics when talking about innovation in public sector. The impact of New Public Management is already discussed in many cases, and it was described in works of Vigoda-Gadot, Windrum, Bason and others. As will be discussed further in this part, New Public Management (or NPM) suggests that well-qualified managers from private sector are asked to implement their knowledge in the public sector to maintain customers` satisfaction. In terms of customers real citizens or end users of public innovation are considered. Public sector becomes somewhat theoretically similar to private sector, and managers are trying to teach public authorities to reach the consumers` satisfaction by providing demanded and well-made service. "Consumer satisfaction becomes central to the definition and measurement of cost efficiency" (Windrum, Koch, 2008).

Windrum and Koch (2008) state that innovation in public sector is of central concern in discussions connected with social welfare, growth and productivity.

The range of public sector organizations is diverse as the roles that they take in innovation process. Public organizations can be important users of new innovations and they also can be active developers of innovations. They often act as suppliers of complementary services that are essential to effective use of private sector goods and services. Medicine or education sector could be a good example of it.

Public and private sector often interact with each other in daily life, bringing to life innovations and useful services for people. Public-private provisions are essential when it comes to business and network services such as transport, information and communication technologies (ICTs). As a good example of good interactions between public and private sector, private car policy can be taken.

The efficient running of transport-based system requires coordination of parking space and traffic flow. It includes support services such as maintenance of the road, lighting, signals and signs, gas stations, repair and breakdown garages. These are provided by a mix of different services (Windrum & Koch, 2008).

According to Vigoda-Dagot (2008), Rogers (1983, p.11) identifies innovation as "an idea, practice, or object that is perceived as new by an individual or another unit of adoption".

Bason Christian (2010) identifies public sector innovation as "the process of creating new ideas and turning them into value for society".

In this paper the case of Toll-ring in Bodø will be examined. Toll-ring is built by Statens Vegvesen or Norwegian Public Road Administration (NPRA).

NPRA takes responsibility for planning, building and operating future or current road projects with finances taken from toll revenues. There is a specific toll company for each project with limited responsibility established by local authorities in order to operate the project and handle financial tasks. Operating regulations are part of a contract with the Ministry of Transport and Communications. The construction of new road or tunnel takes place before the toll collection starts. Toll company then takes loans from banks to provide the necessary amount of money for road construction that will be covered soon with toll revenues. It means that interest also have to be paid back in addition to the loans. Such details have to be taken in consideration when assuming the amount of one-way payment for cars and other vehicles.

It is important to mention that, regarding to the law, the life dedicated to one toll road has to be approximately 10-15 years. After this period the toll has to become free of payment. In other case it is the violation of the road transport policy (vegvesen.no).

As was approved by Statens Vegvesen, The purpose of the toll projects in Norway is to finance the main road projects, allowing them to be completed much faster than would be possible with state funds alone (Odeck and Bråthen, 1997).

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With regards to the theory represented above, toll ring project in Bodø will be considered as innovation, which is new for citizens and which brings new value for them. What is more, public sector is sometimes becoming the main source of innovation (Windrum, 2008). With partnership between private sector and others, public sector innovation can be spread faster than it would be only with the help of public authorities. Together they are aiming at making citizens` life easier.

The example of cooperation between public and private companies can be viewed in such sectors as education and medicine, such as providing schools with new computers or implementing of new MRI machine bought from abroad respectively. In the next part described below I will examine similar road projects and important implications connected with practical examples of similar implementations.

2.1.2 Similar transport projects studied in the literature and important outcomes

In the last decades in Norway there appeared a trend among norwegian toll companies – to establish the toll collection on the roads to fund road infrastructure projects. One of the main reasons why this happens is that European countries budget is restrained, and, therefore, road companies are looking for new ways of getting enough money for the ongoing or future projects. Toll roads collections are helping to get the funding earlier than it would be possible with the governmental budgeting. Unlike the rest of Europe, Norwegian toll companies are established by local authorities and interested groups which are therefore non-budget. They are aiming only to collect money for financing the projects earlier than it would be possible with the government funding (Odeck, Bråten, 2008).

The norwegian public funding and schemes for road financing is restrained due to the need of controlling the level of activity in the economy. If to use public funds too fast and expansively, it can lead to overheating of economy and inflation. For this purpose budget money that are expected to cover the expenses on roads projects are used with a periodicity with an eye not to create a budget gap.

But this is not efficient for road construction companies because funding for projects is needed immediately. This is why tolls appeared (Odeck, Bråten 2002).

Because of many successful examples, Norway is considered as a best practice country when talking about road financing with regards to toll roads.

Compared to the neighbour-countries (Sweden and Denmark), the main factor that helps to explain large numbers of successful toll roads in Norway may be topography. Due to many fjords and mountain landscapes, tunnel and road projects seem inevitable (Odeck, Bråten 2002).

However, toll roads are not always so successful. Projects of new roads construction are passing through several stages (which will be discussed below), and the project may be delayed or neglected because of the long time that it takes to pass the project through all the instances. The other reason why toll roads or other road projects may be neglected is the results of analysis which will show that the road is too expensive, and toll collection will not help it. The organizational framework of Norwegian tall companies is shown below in Figure 1.
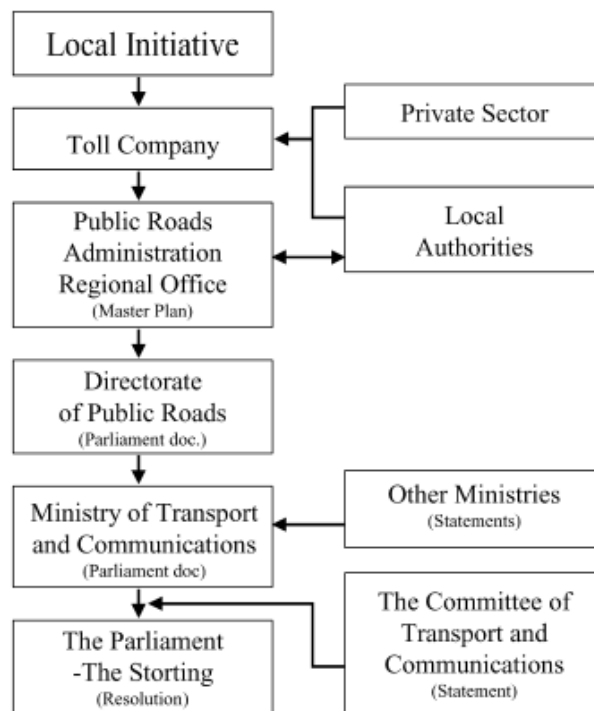
Fig. 1. The organisational framework of Norwegian toll initiatives.

Figure 1. The organizational framework of Norwegian toll initiatives

As can be seen from the figure above, the organizational framework of Norwegian toll initiatives has quite uneasy structure, and every level has to approve the new road policies. Sometimes it can take too much time, and sometime the decision can be lost among all these levels.

"Infrastructure financing in Europe today is being driven by two forces: (1) scarce government funding which is leading countries to look for alternative ways of financing infrastructure by some kind of user charges; and (2) cities are experiencing traffic growth rates which lead to both road congestion and environmental deterioration" (Odeck, Bråthen, 2008).

Toll collections are widely used in three largest cities of Oslo, Bergen and Trondheim. It makes the main funding of road investments and sometimes of public transport investments programs. In 2002 there was 100 toll projects that were successful and only one has been declared as bankrupt (Odeck, Bråten 2002).

We may suppose that the general public is familiar with the true purposes of the innovation. This suggestion could not be relevant if there were no toll road precedents before. According to Odeck (1997), while the research information was being gathered among interviewers, there was an opportunity to choose the reason why citizens think the toll road was built.

The majority of respondents (63-76%) agreed that toll roads were necessary to collect the necessary funding for the road construction. The percentage of people who thought that the reasons were different, such as decreasing the road traffic with an outcome of decreased air pollution, dropped from 32% to 14% in years 1989 and 1995 correspondingly. Odeck`s research showed that, first, the vast majority of people were aware about the real purposes of toll road construction even before such roads were constructed. Second, with the opening of Oslo tunnel in 1990, it became obvious that the purpose was neither the limitation of the congestion nor generating the funds for the city council, but for financing the future road construction projects.

The key decision-making procedure for toll road projects can be summarized as follows (Odeck & Skjeseth, 1995):

- "Toll projects are based on local initiatives and local political agreement at municipality and county level. There is no further legislative requirements like public meetings or hearings, apart from hearings connected to land use impacts. However, an impact assessment program is required for projects above a certain magnitude (investments 400 MNOK during a maximum spending period of 8 years).

- A two step political process is followed when proposing toll projects: A principal acceptance of toll financing. Approval of financing scheme including possible public guarantees.

- All projects must be approved by the Norwegian Parliament.

- A non-profit company is responsible for the toll collections.

- The Ministry of Transport and Communication approves the tolls and the discount systems".

Also it is necessary to mention that while the research Odeck found out that the majority of respondents during the years were thinking negatively about the toll collections. However, there is a positive trend among users. As was discovered, the gender and the level education makes sense, as, for example, women were more negative about tolling than men, and people with higher level of education were more positive about tolling than people with basic education. In the result, everybody agreed that tolling is necessary for funding the road projects, and as a positive outcome the level of traffic in rush hours will be reduced.

However, the main attitude towards toll collection was negative. Especially negative were people that lived in the inner circle of Oslo (Odeck, Bråthen, 1997).

It turned out to be that citizens who lived far from Oslo were not using the toll ring so often, and they were not so concerned about paying for entering the city. However, citizens that were living in the inner cycle of Oslo were really bothered by that. Also private car users were more negative about tolling than those who used transit transport.

In general, people were thinking that implementing of tolls were an expensive way of raising funds, and as a consequence, the belief that these funds were used not only to the roads construction needs but for other purposes appeared and remained stable (Odeck, Bråthen, 1997).

«Today, 25% of the total annual budget for road construction in Norway comes from more than 30 road projects scattered throughout the country" (Odeck, Bråthen, 2002).

As Odeck advises, to eliminate the negative attitudes on tolling, there has to be ex-ante explanation for citizens about the purposes on these collections. Unfortunately, as was stated by Odeck (2002), awareness of people about the projects and consideration of users` opinion about tolling would result only in few toll roads would have been built. However, there exists a negotiation on that there may be other cost-effective ways of financing road infrastructure projects such as PPP (Public Private Partnership). This kind of partnership was not tried in Norway so far, but it may become possible in the future.

As Odeck (2002) states, the question on how to design a road funding scheme that minimizes allocation of costs and is acceptable by the public was given a lot of attention in recent years.

Financial purposes and congestion problem in big cities may seem quite similar. Jones (1998) states that it is really important to specify the connection between toll and congestion pricing: people resist against paying for roads (tolls in our case) because it may be that people expect to be charged not for the things that they would like to avoid but for things they want to acquire.

Here we are talking about the congestion problem that people in the beginning think the road construction companies want to eliminate. It is really important to explain the meaning of payments in the beginning. Ison (2000) as well points out that the use of toll revenues is important for citizens because it is then used for funding into better local transport.

Thorpe et al. (2000) found out that the best way to solve the problem with congestion on roads was to implement tolls and improve local transport system.

Odeck (2002) suggests that with relation to all the mentioned above, to affect acceptability, it is necessary to think of:

- At what time to collect charges, f.e. no charges in the evenings or weekends.

- For frequent users there has to be a limited number of payments in a given period.

The resistance to toll collections is followed by lack of information to the public on the purposes, unclear understanding of policy regarding the use of toll revenues and sometimes badly-explained solutions concerned with the tolls collected.

By the first Odeck means that, as stated above, public need the marketing and advertisement of the road tolling system to show why it can be useful for everybody, connecting arguments for decreasing the level of congestion, increasing the level of public transport services and earning money for funding of the necessary road constructions that will take too long with the governmental funding. By the second he means that local road constructionists have to clarify that money earned from tolls will be spent on local transport. According to DETR (2000a), it is emphasized that for better public reaction it is necessary to implement local transport improvements in the same time as the toll collections are starting. He also pointed out that some locals experienced not being confident in local authorities` actions because they collected the money but decided to invest them in another road projects, forgetting that the current road problem is left unsolved.

Summing up, such projects as toll ring in Bodø already exist in Norway, and researches showed that mostly people are aware of toll roads and other projects implementations, but, as was discovered people still have a negative relation towards toll roads due to many reasons. In discussion part I will once again carefully examine this information and will explain how my research model looks like.

Even though the precedents of toll roads in Norway exist long enough, especially in such big cities as Oslo, Bergen and Trondheim, (Odeck and Bråthen, 1997) toll ring in Bodø can definitely be called an innovation.

2.1.3 Citizens` attitudes and behavior in response to innovation

The topic of the research is connected mostly with citizens attitudes and behavior with relation to innovation in the city. Prihodchenko (2003) gives a really neat explanation on how the process of attitude to the innovation is shaping:

The perception of every kind of new product is happening with regards to following processes: the most simple feelings (like seeing and hearing) from our organs are transmitted to our brain, where they are compared to the experience, knowledge, emotions and vision. As a result a person gets an image of an innovation product and gets relationship to it.

The problem is that this process is usually happening in the head of a consumer, and the innovator will get the resulting relationship to the innovation only when examining consumer`s behavior and attitude toward innovation.

When talking about designing and creating innovation (Bason, 2010), it is necessary to remember that citizens involvement is a key. People - not only citizens, but also business-holders and third parties - have to be considered not only as end users, but also as stakeholders and innovators in public policy. They relate to government as people who have specific demands and expectations, rights, powers and obligations. And there is a rapidly growing recognition that citizens can also be the source of inspiration and innovation for public sector.

Koenig (2005) says that even though everybody knows about the importance of citizens` participation and opinion when making decisions, there still exists one huge problem. Once citizens try to get involved in the decision-making process, they are mainly met with government employees who see themselves as professionals and experts that need only the basic input. The paradox is that government usually tries to make citizens involved into the process only to find that citizens "aren`t necessarily interested in being part if the process". In the result it is not a surprise that cynicism grows when the desire to give and get back input is mismatched among people or parties involved.

The ways citizens are participating in the processes of solution making are usually attending the meetings, participating in focus-groups and questionnaires, serving on task forces. Methods are almost always the same, people are participating, but they participate incidentally, not in terms of an ongoing process.Results of the participation are often unpredictable. Citizens can once participate on a meeting and completely change the agenda, and at the second meeting they can literally do nothing. It is important to realize that citizen empowerment in local government participation is a long-term process, not an incident. Citizens have to be motivated to provide information rather than barely respond to surveys.

"Looking at the process of participation as a series of adaptive movements should give researchers and practitioners a basis to understand why some practices are successful and enduring while other efforts fail to achieve their goals". (Koenig, 2005, p.3)

Vigoda-Gadot (2008) mentioned that citizens` perspectives have gained a lot of attention recently because of the New Public Management (NPM) reform. NPM represents a codename for the implementation of managerialism into old-style bureaucracies.

NPM became a widespread phenomenon in developing and developed countries over the past two decades (Pollitt and Bouckaert, 2000). This view explains that citizens act like real clients on the market and NPM is improving services through market based mechanisms. NPM, as well, is using so-called performance indicators (PI) to measure the level of innovation in different terms such as creativity, adaptation, etc. Based on PI`s, citizens may facilitate improvements and reforms in public innovation, which can be useful for both sides of the innovation implementation process.

« Users' reaction to toll user charges is crucial when it comes to policy development in the transport sector. Knowledge about how users will react and what their attitudes will be when tolls are implemented is still scant in the literature» (Odeck & Bråthen, 2008, p.78). This quotation can be used as interpretation of people's behavior with regards to innovation in transport sector, which is has a direct meaning to the topic of this paper.

People's reaction to change is a topic which is clearly defined in the literature. There are several stages of innovation acceptance which were described well in "The Change Curve" of Elizabeth Kubler Ross (1993).

 From her point of view, when talking about both personal loss and major change, people experience a cycle ranging from shock, denial, anger and anxiety, ultimately moving through the acceptance. And duration and speed of the cycle will depend on degree of change and its impact on people. The process is shown in Figure 2 below.
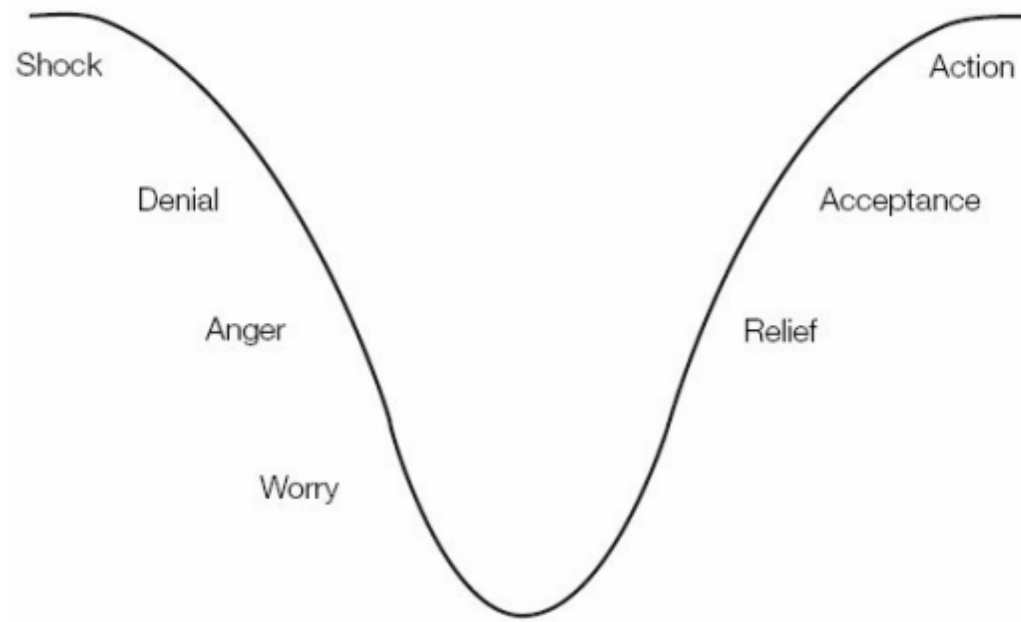
Figure 2. The change curve

The process is not always going only in one direction. Sometimes people that are experiencing changes can find themselves not moving further, but going back to the stage of worry and anger.

Kubler Ross (1993) suggested some actions that has to be taken to make all the stages go easier.

- Shock. This stage is quite dangerous, because people are getting something new and they don`t know the purpose of it. New things usually make people scared. So, during this stage information as well as innovators have to be open and available. Innovator has to be patient to allow people to absorb new information, and he also have to accept that there will be strong emotions. Innovator doesn`t have to argue too much, and at the same time he should not tell people what they "should" feel.

- Denial/Anger. On this stage there have to be offered instructions and steps of using the innovation, rumors and concerns have to be dealt with. The innovator have to be aware of people's moods and be specific.

- Worry and confusion. On this stage the innovator has to communicate with people, listen and be supportive. There has to be direct control, which means that expectations have to be clarified, motivation for innovation has to take place, and the last but not the least – keep people involved.

- Relief and acceptance. Highlight benefits and positives, reward, provide feedback, continue to manage closely, be optimistic, expect some stepback from people and differences in recovery time – that is the requirements which will help dealing with change acceptance on this stage.

It is also important to mention that citizens have to adapt to innovation – there is no way people can escape using toll road. Of course this is the question of concern mostly for drivers and businesses, nevertheless, it is important.

Prihodchenko (2003) states that there exist objective factors of innovation that can be an obstacle in the process of consumer`s perception. She mentioned such factors as:

1. Radicalness of innovation – the degree of newness. In case of *incremental innovation* there is a familiar product which the consumer can address to, and it goes easier for him to accept it. But in case of *radical product* there sometimes appears a need for not only changing the stereotypes about consuming such innovation, but also environment in which the product have to be consumed.

2. Innovation volume – what should happen to make person become a consumer of the innovation. How the innovation will change the lifestyle of a consumer?

Is it influencing some aspects of his/her life?

3. The speed of innovation implementation – too fast implementation, as well as too slow implementation of innovation, is a mistake which can dramatically change consumer`s relationship to it.

4. Specifics of culture.

On the other side there are subjective factors that are usually subjective norms – "perception by someone that most people have about whether they should or should not perform a particular action because of how that action might be perceived by others". (Maizatul Haizan Mahbob, 2011)

Subjective norms can be influenced to get the attitude or emotion that is needed. It is not guaranteed that the outcome will be as planned, but at least it is still possible to try to make changes with regards of getting a positive feedback from end-users.

In this context the theory of planned behavior can be used. Taylor and Todd (1995) suggested a theory, which can be seen in the figure 3 below.
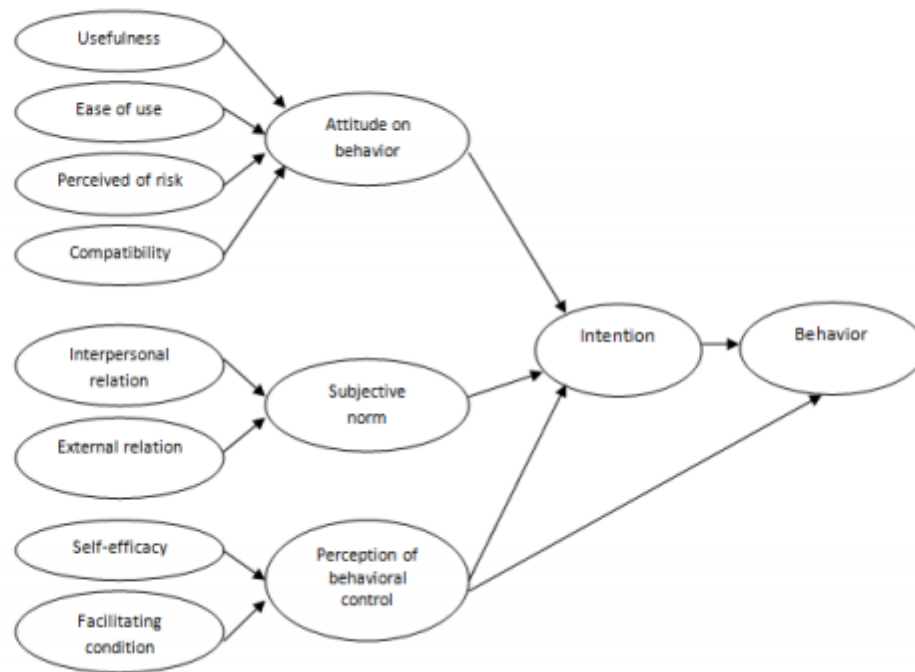
Figure 3. Relationships of Variables in a Model of Decomposed Theory of Planned Behavior

Source: Adapted from Taylor, S. & P. A. Todd. (1995). "Understanding Information Technology Usage: A Test of Competing Models." Information Systems Research, 6(2): 144-176.

As can be seen in the picture above, behavior is not formed randomly, it is caused by specific amount of factors. First, before behavior there comes an intention, and intention is formed by three features such as attitude on behavior (which is formed additionally with usefulness, ease of use, perceived of risk and compatibility), subjective norm (which consists of interpersonal relation and external relation) and perception of behavioral control, PBC (which comes from self-efficacy and facilitating condition).

This is an adapted version, The concept was first proposed by Icek Ajzen. Theory of planned behavior (TPB) is used in explaining psychological basic mechanisms of people's behaviors and explaining factors that influence intention and behavior (Liu & Hong, 2016).

Each factor in this theory is decomposed into sub factors – they make the main scaffold for the theory of planned behavior. The relationships between all factors can clearly be seen on the picture.

As was stated above, subjective norms can be influenced via interpersonal or external influences. It can be face-to-face conversations or mass media. When the knowledge and facilities have been implemented and awareness was created, it is easier for the government to shape a positive image and attitude among citizens or end users to accept the innovation.

Ajzen (2000) stated that TPB is opened for added variables in different contexts, as long as variables can show significant contribution. However, Liu and Hong (2016) also mentioned perceived behavioral control (PBC), which can be used in this case as well and which is as important as subjective norms.

PBC is considered as one of the three traditional indicators of TPB. The original definition of PBC, according to Ajzenand and Fishbein (2000), sounds as "individuals` perceived ease or difficulty of performing a particular behavior, and it reflects the degree of which individual believes he or she is capable of performing a behavior". It is the feeling of control for the choices that a person is making. Chen and Chao (2011) relates to such items of measuring PBC, "I am free to...", "It is easy for me to…", etc.

Especially it is relevant when we are talking about occurred changes in public sector, and when a person have a choice of adapting to these changes.

"Some of the previous researches found that non-car travel behavior depends on PBC as well as attitude or awareness of consequences, with the former having a stronger effect on the choice of mode transportation" (Gardner and Abraham, 2008, p.306).

Eagly and Chaken (1993, p.1): "attitude refers to a stable, evaluative response (affective, cognitive, behavioral) to a particular entity, referred to as the attitude object".

Objects vary depending on the context, in our situation object is the toll ring. The most popular questionnaire items used to measure attitudes are scales and include "It is good to...", "It is useful to...", etc. (Donald 2014, Pakpour, 2014)

In their work, Liu and Hong (2016), are using the ATT – attitude towards public transport. They call it users` evaluation of public transport and their level of satisfaction with relevance to public transport. They assumed that attitude has a direct impact on PBC.

It means that "a positive attitude will motivate PBC, and, what is more, positive attitudes will promote more powerful perception of control over public transport".

I believe that I am able to assume, with regards to previously-mentioned literature, that instead of ATT (attitude towards public transport) I can use the concept of attitudes towards innovation in public sector (toll ring), and assume that more positive attitudes towards this innovation will motivate PBC and promote more powerful perception of control over innovation.

If to consider Theory of planned behavior as a starting point, the assumption arises: if the attitudes of a user towards some kind of innovation are negative, then the behavior also has to be negative. If it is positive, then the behavior also has to be positive. In terms of toll road implementation, it is possible to suggest the first hypothesis of this project:

Hypothesis 1. H1: There is a relationship between people's attitudes towards the innovation (toll ring) and number of passes.

Number of passes in this case is a behavior. And if people have negative attitudes (or feelings) towards toll road, then as a logical outcome, then their behavior has to be negative (they more likely will use the road less).

One more important thing to be mentioned here is habit. Habit was explained by Ajzek and Fishbein (2000) as, first, the relationship between past and future behavior, and second, the relationship between attitude and behavior.

There were several past findings that are suitable for present research. For example, Nordfjaern et al.(2014) found that people who have a car habit tend to have a negative attitude towards using the public transport more if it is promoted by the state. Continuing the previous research, Knabe (2009) discovered that past habit can predict perceived behavioral control.

With such findings, Liu and Hong (2016) assumed that those who have a habit of driving a car or those who have a high dependency on car driving will face difficulties or will show a negative reaction to the suggestion of changing the transport mode or to new road policies.

If, for example, drivers have a specific habit of driving, and this habit is connected with going to work, for example, then this habit will probably stay the same, not taking in consideration the new road policies, because going to work is not something you can delete from the schedule, and changing a transport mode could be inconvenient.

Logically, here we can formulate second hypothesis:

Hypothesis 2. H2: People who use toll road more are less likely to switch to another means of transport.

Bason Christian (2010) says that "One of the key barriers to innovation in today`s public sector is that there is often a very diffusive understanding of the value the organization is trying to create." It is important to explain why the innovation is taking place and which value it brings. The theory of planned behavior can be used in this situation.

When a consumer starts to get acquainted with an innovative product, there often appears several problems.

1. When talking about learning about the innovation, a consumer may lack information. Without necessary and correct data, the image of the innovation may be not shaped, and the consumer will result in negative or indifferent attitude.

2. If the shape of an innovation is getting formed no matter what, it can be distorted.

However, I believe that in most cases innovators want to see a positive feedback from users. In the result the consumer doesn`t get a real understanding about the product.

Prihodechenko (2003) advises following methods to form a right image of the innovation in terms of customer perseption:

1. Make the innovation visible

2. Show the most successful analogues and make comparison to them

3. Make the information about the innovation emotional

4. Make the information personal, relate it to the customer

5. Connect it with the successful experiences of analogues

6. Connect it with the successful experience of satisfying a specific need

7. The process of representing the innovation have to be forwarded to the understanding that it is the way of satisfying a specific need or solving specific problem among end users.

Hord and Hall (1987, p.211) also made an input in this topic and suggested "concerns-based adoption model". According to them, there exists 7 stages of concern. This model helps to understand and then address innovators` concerns about change.

Stage 0: Awareness

Issue: Aware that innovation is introduced but not interested in.

Example: "I don`t know what is this innovation, I am not concerned about it".

Solution: If possible – involve people in discussions, share information, realize that lack of awareness is expected.

Stage 1: Informational

Issue: interested in some details of change.

Example: "I don`t know a lot about it, but I am trying to get more information".

Solution: Provide clear data and explanations about innovation, use several ways of sharing the information, help see people the relationship with their lives.

Stage 2: Personal

Issue: Wants to know the personal impact of the innovation

Example: "How will it affect me and how much control I will have over it?"

Solution: Legitimize the expression of personal concerns, connect with other people who had already become sustained and can be supportive.

Stage 3: Management

Issue: How the change will be managed in practice.

Example: «This is going to be more difficult than expected".

Solution: Clarify steps, provide answers, demonstrate exact solutions.

Stage 4: Consequences

Issue: Interested in the impact on users

Example: "How is it going to affect users and what can I change to do the innovation better and more available?"

Solution: Provide users with the opportunity to check out about the similar innovations in another places.

If not to follow these steps while implementing innovation, users can perceive a negative attitude to it and as a result behavior that does not correspond with public authorities expectations.

If to consider theory mentioned above and findings of Odeck and Bråthen (1997 & 2002), mentioned in the previous sub-section, that were saying that people that are aware of the reasons of the road projects constructions have more positive attitudes towards them. We can assume that these observations can be the same in our case and formulate two new hypotheses:

Hypothesis 3. (H3): Respondents who report the correct reason why the toll ring is introduced are more likely to be positive towards the toll ring.

Hypothesis 4. (H4): Proper ex-ante information and clear purposes explanation from government related to the toll road implementation could make people's attitudes more positive.

The correct reason why such projects are implemented was stated by Odeck and Bråthen (1997) and was supported by Statens Vegvesen.

The reason for such projects is to get faster financing for ongoing or future road projects in Norway without waiting for slow and rigid budget from the state. Besides, the government have to announce the project construction, and usually people know that the road is going to be built. So they will have time to adjust to it and get accustomed to the idea that money for road using will be collected. Knowing this information in theory and in practice have to lead to better attitudes towards innovation. In the analysis part we will see if it is the same for the case of toll ring in Bodø.

What is more, and what is also really important: is the price of innovation affordable for consumers? According to classical economics, there are different price strategies existing on the market, and the choice of the price depends on the product, demand, level of newness, innovator-comapany`s price-competition strategy and others (Cze, 1988).

Kuester (1999) in her article mentions that when it comes to innovation implementation, the price sensitivity is very important. There are situations when the customers of the innovation are very sensitive about the price. The price sensitivity that can be observed is actually an indicator of buyers` switching costs – it defines the easy with which buyers can switch to a substitute. If the price settled is very high, then buyers just switch to another seller, because they don`t understand what they are paying for and feel negative toward higher price.

In case of toll ring there exists no competitor towards which people can switch to, but there exists public transport that they can use instead of cars. As a probable outcome it is possible to assume that when users of the toll ring will understand that the price for the toll is high, they would try to avoid using the toll, and their attitude towards it well get worse.

Also Odeck (2010) noticed that toll rate is an important variable that can influence users` charges. He claimed that authorities have to be really cautious when setting the toll rates. In other case there will be little or no acceptance at all by the road users. Attitudes towards tolls were discovered to be more negative if the price was increasing, and visa versa, more loyal if the prices were going down.

Combining these two observations, we can formulate three more hypotheses: 5a, 5b and 6.

Hypothesis 5a. (H5a): Higher price can negatively affect attitudes.

Hypothesis 5b. (H5b): Higher price can negatively affect behavior.

Hypothesis 6. (H6): People with negative attitudes towards innovation are more likely to switch to another transport alternatives.

I decided not to split hypothesis 5 in two separate hypotheses because the relationship between variables "feelsnow" and "behav" will be studies further in the analysis part. Since there will be both correlation and regression for them, as a logical outcome it is possible to correlate both with price as well to see how these three variables work together and how are they connected to each other.

Hypotheses 5a and 5b are based on both Kuester (1999) and Odeck (2010) observations, where Kuester claims that people that are unsatisfied with price level will switch to another seller and Odeck states that such people will not accept the new road policies.

In first case, I believe that instead of the definition "seller" I can use "transport alternative". This can be also applied to Hypothesis 6, because now we got the right formulation of it – those who are negative will probably switch to another "seller" (transport alternative). Hypothesis 5b literally means almost the same, but it considers specifically price. And hypothesis 5a is based on Odeck`s findings and works with interconnection between price and attitudes.

In the outcome it is expected that people with negative attitudes will try to switch to another transport, and people who do not like the price for using the tolls are expected to be negative towards it and are also expected to switch the transportation mode.

To sum up, citizens` behavior and attitudes towards public innovation is a phenomenon that is formed in a really difficult pattern, and mostly the relationship comes from people's own heads, experiences and knowledge. However, using the theory of planned behavior (Ajzen and Fishbein, 2000), being aware of Kubler-Ross "Change Curve" (1993) and following the advices of Prihodchenko (2003) and Hord and Hall (1987), authorities can influence people's attitudes in a positive way, forming the new relationship to the innovation. Also with the help of the "change curve" and TPB we can suppose that there exists a connection between negative attitudes and the number of passes through the toll ring.

Bodø is the biggest city in Nordland with quite clear infrastructure. People's lives and movements in and out of city seem to be quite structured and easy, the companies inside the current toll ring also seemed to be adjusted to the roads infrastructure that they had. However, with the appearance of Bodø toll ring, many of the old habits probably will be changed. In other words, the introduction of toll road makes a lot of differences in peoples` everyday life like every innovation does.

3. Research model and derivation of hypotheses

My research model looks as follows:
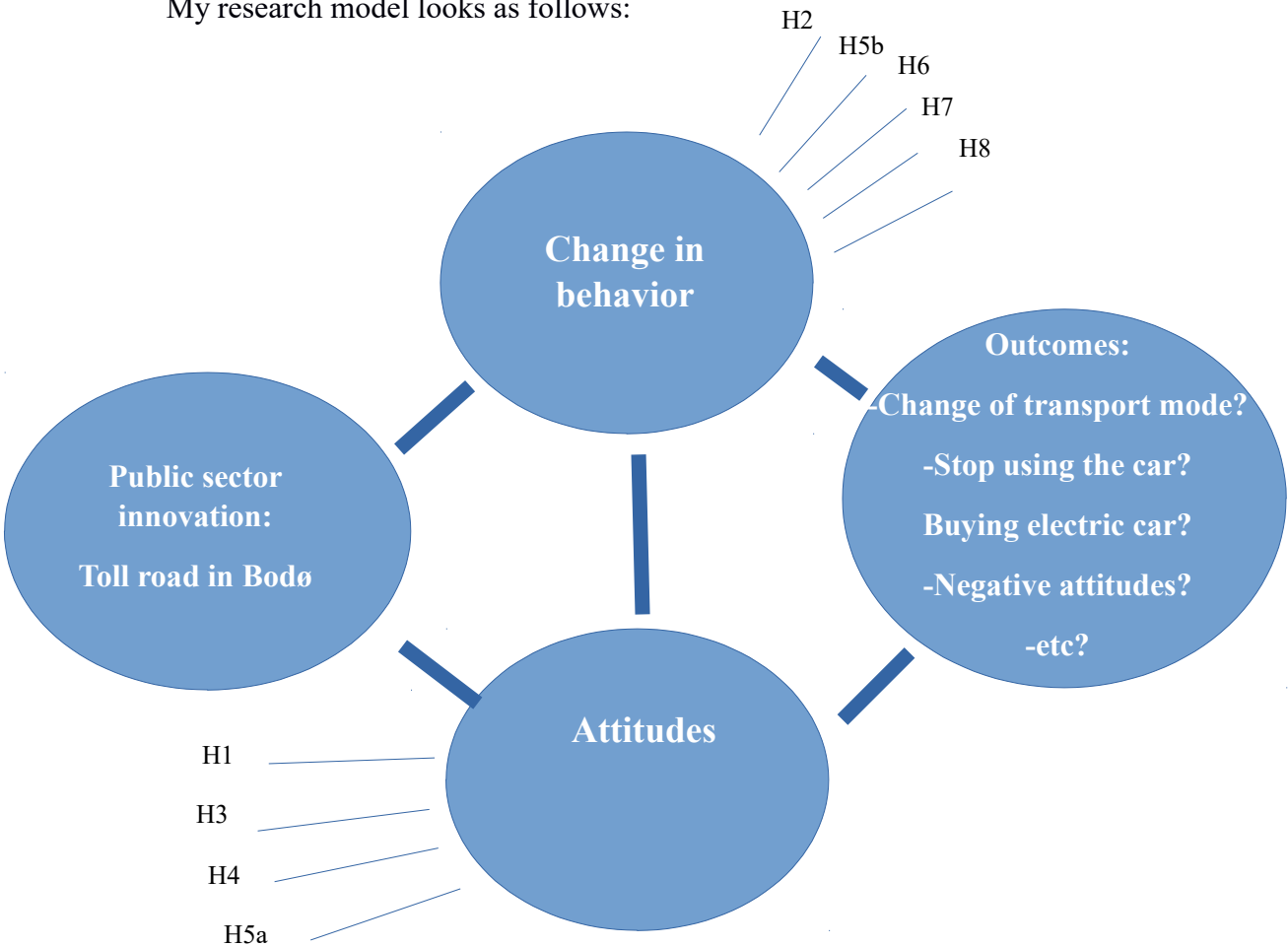
Figure 4. Research model

First, I am examining the meaning of public sector innovation and check how citizens react to it by means of attitudes and behavior towards the toll road. According to literature part, attitudes are expected to be negative, but I will check if it is true. Toll road users are also expected to change their behavior. The outcomes of these two phenomena can be very different and unpredictable. Some of them are quite obvious, such as change of transport mode, buying electric car, cutting down on using the old car, etc. I will then check if citizens were well-informed about the innovation, if they understand the purposes of toll collections and which attitudes they have towards toll ring in Bodø.

As can be seen from the picture above, the concept of changes in the behavior is tested with 5 hypothesis: 2, 5b, 6, 7 and 8. Attitudes will be measured with the help of hypotheses 1, 3, 4, 5a.

I will also take a look at how exactly people are acting with regards of introducing the innovation – probably, there appeared some changes in their lives which can be very important not only for this research, but for the transport company as well.

The results of this research can be used further to develop the process of introducing similar road or transport projects which have direct effect on people's lives.

Based on the literature, I will be working with 8 hypothesis. Several of them are tentative hypothesis, based on the observations and previous results of testing. Here are they:

Hypothesis 1. (H1): There is a connection between negative attitudes and number of passes — based on the TPB by Ajzen and Fishbein (2000), related to attitudes.

Hypothesis 2. (H2): People who use toll road more are less likely to switch to another means of transport — based on the concept of habit byNordfjaern et al (2014) and Liu and Hong (2016), related to behavior.

Hypothesis 3. (H3): Respondents who report the correct reason why the toll ring is introduced are more likely to be positive towards the toll ring — based on awareness concept suggested by Hord and Hall (1987) and Odeck and Bråthen (1997 & 2002), related to attitudes.

Hypothesis 4. (H4): Proper ex-ante information and clear purposes explanation from government related to the toll road implementation could make people's attitudes more positive — also based on the findings of Odeck and Bråthen (1997 & 2002), related to attitudes.

Hypothesis 5a. (H5a): People who report that the price for tolls is high are more likely to be negative towards toll ring – based on finding of Kuester (1999) and Odeck (2010), related to attitudes.

Hypothesis 5b. (H5b): People who report that the price for tolls is high are more likely to change their behavior towards more negative – the same as (H5a).

Hypothesis 6. (H6): People with negative attitudes towards innovation are more likely to switch to another transport alternatives — based on Kuester (1999) findings and addresses behavior issue.

Hypothesis 7. (H7): People with negative attitudes towards toll road, especially those who use it more, are more likely to switch to electric cars

Hypothesis 8. (H8): After the implementation of the toll ring there is a drop in the number of passes — a tentative hypothesis based on statistical data gathered by Statens Vegvesen.

4. Methodology

4.1 Research design

The aim of the current study is to investigate the relationship between variables, and for this purpose certain type of survey has to be chosen. Some types of surveys were analyzed, and inferential survey was chosen as the most appropriate. Inferential survey means that the relationship between dependent and independent variable has to be determined. It also has to meet the objectives of the study. When inferential survey is used, the researcher has to isolate appearing factors and decide what causes these factors. In other words, the researcher has to specify dependent and independent variables of the research (Easterby-Smith et al., 2012).

In this research behavior and attitudes will be uncovered through analyzing different correlations and regressions. Factors that influence these variables will be observed, information for observing will be taken from the quantitative research (which was performed with the help of SPSS statistics) and some statistical data obtained by Statens Vegvesen from the roads by means of electronic recorders.

4.2 Choice of method

From the beginning triangulation was planned to be used – both qualitative and quantitative data seemed a reasonable solution for testing the hypotheses. We wanted to observe the situation from several angles, but since we needed mostly generalised opinion of people, we realized that in-depth interviews will not be helpful since this is not the problem of a deep concern, and each person is most likely to have something specific in mind, sometimes not corresponded with the general opinion that we needed. Then due to the shortage in time, qualitative research was decided to be removed from the list. Besides, it was decided that quantitative research is the right thing since the innovation is regarding the whole city, and the more opinion would be gathered, the better the results we will get in the outcome.

4.3 Development of the questionnaire

The questionnaire was supposed to be designed in a way that would be easy to use and to understand. Since the survey was going to be conducted in Bodø, it had to be translated to norwegian language.

Respondents were able to choose which language they wanted to use while answering the questions.

When respondents were choosing specific answers that were arising specific questions regarding their choice, the page with questions was switching to the page with further connected continuance. All the variants and alternatives were designed in advance with regards to expected answers that we were expecting to see.

The questionnaire was designed in order to understand what people think about the innovation and how do they behave with regards to it. All questions were properly thought of and discussed with both supervisor and project manager of the toll ring in Bodø. Some of the results are not used in the further testing because they are not so relevant for analysis, but are more relevant for the project manager and their own statistics.

4.4 Data collection and sample

The survey was conducted in Bodø, Norway, since it was the place where the toll ring was introduced. Bodø is a city and at the same time municipality of Salten region. At the moment there lives approximately 50000 people (statistics for 2015). During each month in 2015 approximately 730000 passers were registered.

The toll ring in Bodø was implemented on the 15th of October,2015. Norway has a big experience in building such toll stations for collecting money for faster financing of future or ongoing road projects. At the moment there are 210 of such stations all around Norway. The basics of such station is that the driver have to pass it without stopping, and later he/she receives the invoice for paying. But also there exists a system of discounts and special offers. For example, the users of electric cars are getting benefits from using their cars while passing through toll-stations.

Users of ordinary car have a number of trips that they have to pay for after which they can pass for free. Auto-pass device is used for such aims, and a driver have to put money on it like on ordinary cellphone.

These are the examples of Statens Vegvesen`s intention to make the toll ring implementation not so negative in terms of people's attitudes towards it – there exist ways of reducing the payment or eliminating it at all.

The survey was conducted in April, 2016 using a random sampling method with a small combination of snowball sampling. The questionnaire was constructed with the help of special platform called questback. The electronic questionnaire was posted on the Internet on several websites with a short description and a request to answer a survey.

The project manager of the toll ring in Bodø helped to send out the link to the questionnaire, and it was also posted on the Nord University inner network of Business School.

In addition to this I was myself sending out the link to friends and acquaintances and asking them to complete the questionnaire and spread it among their own friends. Mostly we, project manager and I, were focusing on people who had cars in their possession because the reaction of car users was the main point of interest for Statens Vegvesen.

Before designing questionnaire, relevant literature was read and there were organized several meetings and discussions with supervisors and project manager of the toll road.

The problem statement was suggested by the project manager with relation to the information that Statens Vegvesen wanted to gather and to the specialization if the researcher. The questionnaire was designed in a way to satisfy the interests of both sides.

There were 378 people who participated in the questionnaire, 47,6% of women and 50,3% of men. Most of the respondents are 46-55 years (32,5%), then on the second place people who are 56-65 (22,5%), third place is with people who are 36-45 (20,4%) and the next category which have weight on this diagram is young people who are 25-35 (15,1%). The vast majority of respondents are employed in a public sector (90,4%) which is the outcome of the placement of the link with a questionnaire. According to the obtained results, only 4,5% of the questionnaire participants do not have a car at the moment, all other have either one or several cars in the household.

4.5 Unit of analysis

Defining the unit of analysis is considered as a common dilemma when the research design need to be created. The purpose of this thesis is to understand how exactly people react to innovation in the public sector and what do they feel towards it. Basically, there are two main units that has to be mentioned – population (or citizens) and toll ring itself. The research was conducted in one city – Bodø, and the introduction of toll ring was studied.

In this case sample consists of citizens who use (or maybe do not use) the innovation. The opinion of people who do not use toll ring is also important, because they may have a very specific attitude towards innovation, and it can both be people with no car at all or those who decided to stop using the car. So, therefore, the unit of analysis are the individuals in Bodø.

4.6 Limitations of the survey

The main limitation of this survey is connected with the problem that 90% of the respondents are public sector employees.

The city does not consist of the public sector workers only, so in the result we get the analysis that is not concerned with the opinion of, for example, pensioners and students, which make up quite a big part of the city.

What is more, the opinion of some respondents may be biased since they may be directly connected to the project, so as the outcome they will write the opinion that is "the right one" with relation to innovation. Some of them may probably hide their own attitudes as the attitudes of ordinary people, not those who were making this project into life.

The other problem that is met in this research is the way the link was spread. As was stated above, it was a random sampling with a part of snowball sampling. It would be more effective if the link would be spread not only with the means and abilities of the researcher and the project manager, but also with the help of administration center of the city. Then as the result answers could be collected not only from public sector workers, but also from all others categories of citizens.

4.7 Validity and reliablity

Quantitative research is primarily dealing with numerical methods, while qualitative research is more common to use exploratory approaches and textual data. In this work the quantitative method is used. Research methods which result in the production of numerical data tend to use experiments and surveys. But both qualitative and quantitative researches can address internal and external validity.

Validity is an important key to effective research.

Internal validity (causality) seeks to demonstrate that outcomes of a specific event, issue or data set can be explained and sustained by the data. At some extent it concerns accuracy, which can be applied to both qualitative and quantitative research. Finding of the research must accurately describe the observed phenomena (Cohen, Manion, Morrison, 2007). In other words, to maximize the internal validity of the research, all alternative explanations for the differences among groups have to be eliminated.

Content validity demonstrates that the instrument must show that it fairly covers the items or domain that it is supposed to cover. In other words, researcher has to make sure that the issues to be covered in the research represent the wider issue under investigation and that units included in the sample also are themselves addressed in depth and breadth.

External validity (generalization) refers to degree to which the obtained results can be generalized to the whole population, situation or case.

Thus, reliability in the quantitative research is often a "synonym for dependability, consistency and replicability over time, over instruments and over group of respondents"(Cohen, Manion, Morrison, 2007). Research can be called reliable if it would be carried out on a similar group of respondents in a similar context, and afterward similar results would be obtained.

Reliability is directly related to the validity of the measurement. It is important to remember that several situations can occur. First, the research can be reliable, but not valid. Second, validity is more important than reliability. But, nevertheless, the research is performed good if it is both reliable and valid.

What is important to remember is that the research tool, whether this would be a survey, test or something else, should provide the same information if used by different people. Also the internal consistency have to be assessed.

According to the questionnaire that was performed in order to reach the goals of the research, it can be said that:

- The research can be considered reliable. The same results are likely to be obtained if the questionnaire would have been spread once again among the same respondents. The main limitation was described before – since the questionnaire was spread mostly among public sector workers, it is difficult to predict that the same answers would be gathered among other individuals representing other parts of population.

- Internal validity is difficult to be proven in this case because it is about causality, in other words research results have to reflect reality accurately. It is difficult to tell this about the present research because the survey was conducted at one point at the time. But the aim was not to study cause and effect relationship.

- Content validity – content was approved by the supervisor and project manager, besides the questionnaire development was being done with their supervision and help.

- External validity faces the same problem as reliability – due to limitations of the research, it can not be definitely said that the results obtained could be generalized among the whole population of Bodø but are definitely relevant for public sector employees.

4.8 Data analysis

The main instrument of analysis in this research was Statistical Package for Social

Sciences (SPSS) 24.0. With the help of this tool the main phases of quantitative research were used. These phases were:

- Descriptive statistics, frequency tables were used to describe the respondents of the research in more details, to get a better image of the sample.

- Correlation analysis was used to establish strength and character of the linear relationship between two(or more) variables. Pearson`s correlation coefficient (r) was used to establish relationships.

Spearman`s correlation was used only once to check that it is almost the same with Pearson`s.

Values of Pearson`s correlation coefficient can very between (-1) and 1 (Pallant,2013). The following guidelines were suggested to estimate the strength of the relationship:

$r = 0.10$ to 0.29 – correlation is meaningless;

$r = 0.30$ to 0.49 – correlation is medium;

$r = 0.50$ to 1.0 – correlation is meaningful.

- Regression analysis was used in order to test the hypotheses by observing the relationship between dependent and independent variables. R square was checked with special attention because it is showing to which extent the model can be applied to the whole population. The higher R square was, the better it was explaining the variance of the dependent variables around their means(Easterby-Smith et al., 2008).

Next important item for analyzing was Beta, larger values of which show that corresponding variable makes significant contribution to explaining the model among all other variables. Beta can vary from (-1), perfect negative relationship and 1, perfect positive relationship. Statistical significance (Sig.=.000) is also an important factor to analyze since it shows is independent variable shows "statistically significant unique" prediction of dependent variable (Pallant, 2013: 167).

In this research level of significance $p < 0.10$ is chosen due to limitations – I will be observing results with this level of significance because they could be important if there would be another sample.

4.9 Operationalization of variables

For easy understanding and analysis the following recoded variables will be represented below in this research. Here will be represented: four dependent variables behav, feelsnow, othertransport, elcar, one control variable gender, and three independent variables finans, info, price. Full questionnaire can be found in Appendix 1.

Dependent variables:

behav

Relates to Q12 "How many times a week(on average) you pay for passing through the toll ring?"

The answer alternatives can be seen in appendix x, as well as the answer alternatives for the other questions.

Originally question had 10 answeres, but since not everything is relevant for analyzing, it was cut down to 7 and missing values. The first 7 alternatives represent the same alternative as in the original version, all other answers were recoded as missing. Look below to see the difference.

Table 1. Recoding of Q12

Question	Aternatives	Position	Recoded Alternatives	Recoded poisiton
How many times a week(on average) you pay for passing through the toll ring?	1 — 2	1	1 — 2	1
	3 — 4	2	3 — 4	2
	5 — 8	3	5 — 8	3
	9 — 12	4	9 — 12	4
	13 — 20	5	13 — 20	5
	21 — 26	6	21 — 26	6
	More than 26	7	More than 26	7
	None	8		
	I don`t know	9		
	Other	10		

Feelsnow

Relates to Q19 "How do you feel about it now?" (with relation to toll ring) and was cut down from 5 variants of answers to 3. In this variable the following answers are represented:

1 - "Positive"

2 - "Indifferent"

3 - "Negative"

The other answers were coded as missing values.

Below you can see the table 2 with the old values and the new ones. The same tables are represented further for other variables.

Table 2. Recoding of Q19

Question	Aternatives	Position	Recoded Alternatives	Recoded poisiton
How do you feel about it now?	Poitive	1	Positive	1
	Indifferent	2	Indifferent	2
	Negative	3	Negative	3
	I don`t know	4		
	Other	5		

Corresponds with Q14 "Is it possible to say that since the toll road implementation you started to use other kinds of transport more?".

0 - "no"

1 - "yes"

The third variant is recoded as missing values.

Table 3. Recoding of Q14

Question	Aternatives	Position	Recoded Alternatives	Recoded poisiton
Is it possible to say that since the toll road implementation you started to use other transport more?	Yes	1	No	0
	No	2	Yes	1
	I don`t know	3		

Elcar

Correspond with Q16 "Do you plan to buy electric car in the nearest future?»

Only the first alternative "Yes, because of the toll ring" got position "1", because this is the answer that directly relates to the issue. All other variants, except for missing values, were recoded as "0". Missing values were not coded as "0" because more likely these missing values appeared due to absence of redirection of some respondents to this question.

 If they would be redirected, we probably could get more answers.

Table 4. Recoding Q16

Question	Aternatives	Position	Recoded Alternatives	Recoded poisiton
Do you plan to buy electric car in the nearest future?	Yes, because of the toll-ring	1	All other variants	0
	Yes, I planned it before	2	Yes, because of the toll ring	1
	I am unsure if I need one	3		
	No, I don`t need electro car	4		

Control variable:

Gender

Corresponds with Q1 "What is your gender?"

0 - "Female"

1 - "Male"

Table 5. Recoding Q1

Question	Aternatives	Position	Recoded Alternatives	Recoded poisiton
What is your gender?	Male	1	Female	0
	Female	2	Male	1

Independent variables:

Info

Represents Q22 "Do you think that your opinion about toll ring implementation could be better if there would be better information flow from the state?"

The new answer alternatives are:

0 - "No"

1 - "Yes"

Others were coded as missing.

Table 6. Recoding of Q22

Question	Aternatives	Position	Recoded Alternatives	Recoded poisiton
Do you think that your opinion about toll-ring implementation could be better if there would be better information flow from the state?	Yes	1	No	0
	No	2	Yes	1
	I don`t know	3		

Corresponds with Q17 "What do you think is the main purpose of building the toll road?", but with the third alternative "Financing of future or ongoing road projects" (17.3).

Is now represented as:

1 - "1"

All other answers - "0"

Since this alternative is the main, it was supposed to be the first choice among other variants. If it was chosen as second, third, etc. - this is already incorrect and is recoded as "0".

Table 7. Recoding of Q17.

Question	Aternatives	Position	Recoded Alternatives	Recoded poisiton
What do you think is the main purpose of building the toll road?	Reducing the traffick	1	All other variants	0
	Reducing pollution	2	Financing of future or ongoing road projects	1
	Financing of future and onhoing road projects	3		
	One more reason to collect money	4		
	Motivating people to use public transport more	5		
	Other	6		

Price

Corresponds with Q23 "Do you think that the tariff for using the toll ring is expensive?"

1 - "yes"

2 - "no"

The third variant recoded as missing.

Table 8. Recoding of Q23.

Question	Aternatives	Position	Recoded Alternatives	Recoded poisiton
Do you think that the tariff for using the toll-ring is expensive?	Yes	1	No	0
	No	2	Yes	1
	I don`t know	3		

Summary

The chapter revels methodology, specifically research design, data collection, definition of reliability and validity and representation of the operationalized variables as the main points of interest to research.

The questionnaire was designed in a way to satisfy both needs of Statens Vegvesen and the researcher. The analysis will be performed by using frequencies, preliminary correlations and regressions. The definitions of reliability and validity were given, the research was considered reliable and valid, but due to limitations of the research further spreading of the research may cause different results.

5. Results of data analysis

5.1 Frequencies

Here some general information about the unit of analysis is represented to make it more easy to work with further correlation and regression models. For better understanding unit of analysis the frequency tables will be ran and described a little. The unit of analysis, as was stated before, is represented by the population.

Among all the respondents it is clearly observed that in general it was almost equal correlation between male and female respondents – 190 men and 180 women were participating in the project, the other 8 people refused to answer this question. With the help of frequency analysis the numbers can be observed in table 9.

Table 9. Gender frequency

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	190	50,3	51,4	51,4
	Female	180	47,6	48,6	100,0
	Total	370	97,9	100,0	
Missing	System	8	2,1		
Total		378	100,0		

From the diagram 1 and table 10 (look below) it can be seen that most of the respondents are 46-55 years (which is 32,9%), then on the second place people who are 56-65 (22,7%), third place is with people who are 36-45 (20,6%) and the next category which have weight on this diagram is young people who are 25-35 (15,2%).

Diagram 1. Age
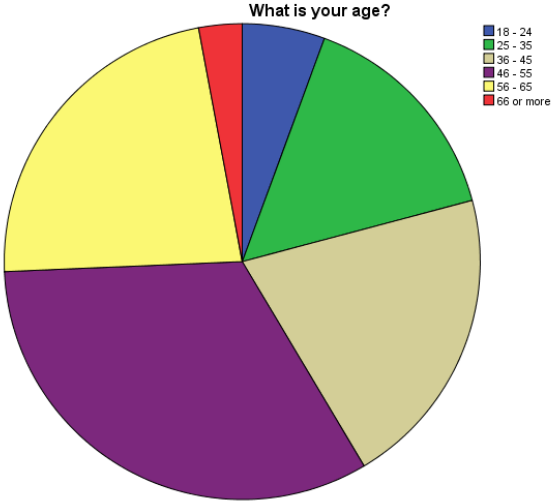
Table 10. Age frequency

What is your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 24	21	5,6	5,6	5,6
	25 - 35	57	15,1	15,2	20,9
	36 - 45	77	20,4	20,6	41,4
	46 - 55	123	32,5	32,9	74,3
	56 - 65	85	22,5	22,7	97,1
	66 or more	11	2,9	2,9	100,0
	Total	374	98,9	100,0	
Missing	System	4	1,1		
Total		378	100,0		

90,4% of respondents are currently employed in the public sector, and it doesn`t represent the whole picture of people who live and work in the city. Very little part of the research were students (5,6%) and pensioners (1,1%), however, they are also a very important part of the whole population who is also using cars (table 11). This issue was described a little bit more in the "limitations of the research" part.

Table 11. Occupation frequency

What is your occupation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed in the public sector	340	89,9	90,4	90,4
	Employed in the private sector	8	2,1	2,1	92,6
	Student	21	5,6	5,6	98,1
	Pensioner	4	1,1	1,1	99,2
	Self-employed	1	,3	,3	99,5
	Other	2	,5	,5	100,0
	Total	376	99,5	100,0	
Missing	System	2	,5		
Total		378	100,0		

Most of the respondents have one or several cars in the household: 57,4% have one car, 38,1% have several cars.

Table 12. Possessing of car frequency

Do you (or your family) have a car?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, one	217	57,4	57,4	57,4
	Yes, several	144	38,1	38,1	95,5
	No	17	4,5	4,5	100,0
	Total	378	100,0	100,0	

Among the 144 respondents who answered that they have several cars 139 later responded that they used all the cars before toll road implementation.

Table 13. Use of several cars before the toll ring frequency

Did your family use all the cars before toll-road implementation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	139	36,8	96,5	96,5
	No	5	1,3	3,5	100,0
	Total	144	38,1	100,0	
Missing	System	234	61,9		
Total		378	100,0		

Among those 139 people only 91 use all the cars after the toll road implementation (table 14). Only one person decided to stop using his(her) cars anymore.

Among those 217 people who who had one car before the toll road implementation only 157 don`t change the habit of using it (table 15). Only 4 people decided to stop using cars.

Among those 4 who stopped using the car 3 switched to the bus and one decided to use bicycle (table 16). The transport alternative for the person who had several cars and decided to stop using them all is not known as it was not obtained.

Table 14. Use of several cars after the toll road frequency

Do you still use all the cars(after the toll-road implementation)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, we use all the cars	91	24,1	65,5	65,5
	Partly, we use one car more than other(s)	39	10,3	28,1	93,5
	No, we use only one car now	8	2,1	5,8	99,3
	No, we don`t use our cars now	1	,3	,7	100,0
	Total	139	36,8	100,0	
Missing	System	239	63,2		
Total		378	100,0		

Table 15. Use of one car after the toll road frequency

Do you still use your car(after the toll-road implementation)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, everything is the same	157	41,5	72,4	72,4
	Yes, but less often	56	14,8	25,8	98,2
	No, I don`t use it	4	1,1	1,8	100,0
	Total	217	57,4	100,0	
Missing	System	161	42,6		
Total		378	100,0		

Which alternative you have chosen?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bus	3	,8	75,0	75,0
	Bycicle	1	,3	25,0	100,0
	Total	4	1,1	100,0	
Missing	System	374	98,9		
Total		378	100,0		

Most of the respondents (38,9%) felt negative when they discovered that the toll ring is going to be built (table 17).

Table 17. Attitudes before toll road implementation frequency

How did you feel when you discovered that the toll-ring is going to be built?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Positive	87	23,0	23,0	23,0
	Negative	147	38,9	38,9	61,9
	Indifferent	113	29,9	29,9	91,8
	I don't know	23	6,1	6,1	97,9
	Other	8	2,1	2,1	100,0
	Total	378	100,0	100,0	

This was the short overview of the most important answers, now we will move to the analysis part where hypotheses and correlation and regression models will be overviewed.

5.2 Correlation analysis

Hypothesis 1. (H1):

There is a connection between negative attitudes and number of passes.

We can start with looking at two variables - "feelsnow" and "behav" which correspondingly correlate to Q19 and Q12. "Behav" is going to be represented as independent variable, and we will check if changes in "feelsnow" variable will influence people's behavior.

First, bivariate correlation is done, and it is seen from the table x that the correlation is positive (0.226), which means that if the dependent variable "behav" is changing towards more passes, independent variable will change positively towards a negative feeling. Correspondingly, the more people use the road, the less they like it. Since the correlation is statistically significant at the level of 0.01, the whole interconnection is very significant significant.

Table 18. Correlation between behavior and attitude

Correlations

		behav	feelsnow
behav	Pearson Correlation	1	,226**
	Sig. (2-tailed)		,000
	N	355	332
feelsnow	Pearson Correlation	,226**	1
	Sig. (2-tailed)	,000	
	N	332	352

**. Correlation is significant at the 0.01 level (2-tailed).

As an additional research I decided to check the answers of those who were saying that they still use their cars for more descriptive picture. We can see that those who had one car tend to use their car less if they have a negative attitude, and those who had several cars are less likely to use their cars less even if the attitude is negative. In both cases the correlations are not significant. As it can be seen from table a, the correlation is small itself (0.012) and the sig. 0.862 (table 19). In the second table b the correlation is -0.021 and is also very small itself, and the sig. Is 0.816 (table 20).

Table 19. Correlation between attitudes and using the car after the toll road implementation

Correlations

		feelsnow	Do you still use your car (after the toll-road implementation)?
feelsnow	Pearson Correlation	1	,012
	Sig. (2-tailed)		,862
	N	352	202
Do you still use your car (after the toll-road implementation)?	Pearson Correlation	,012	1
	Sig. (2-tailed)	,862	
	N	202	217

Table 20. Correlation between attitudes and using all the cars after the toll road implementation

Correlations

		feelsnow	Do you still use all the cars(after the toll-road implementation)?
feelsnow	Pearson Correlation	1	-,021
	Sig. (2-tailed)		,816
	N	352	130
Do you still use all the cars(after the toll-road implementation)?	Pearson Correlation	-,021	1
	Sig. (2-tailed)	,816	
	N	130	139

48

It can be concluded from both cases that even if some people have a negative attitude towards innovation, only few decide to cut down or stop using their cars. The majority continues using cars without any dramatic changes.

Hypothesis 1 is going to be tested further with regression.

Hypothesis 2. (H2):

People who use toll road more are less likely to switch to another means of transport

In the correlation table below it is shown that when people are using cars more, they do not practically switch to another means of transport. This is proven by the correlation 0.181, and it is significant at the 0.01 level (table 21). The correlation is very significant.

Table 21. Correlation between behavior and likelihood of switching to another transport

Correlations

		behav	othertransport
behav	Pearson Correlation	1	-,181**
	Sig. (2-tailed)		,001
	N	355	339
othertransport	Pearson Correlation	-,181**	1
	Sig. (2-tailed)	,001	
	N	339	359

**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis 2 is going to be tested with regression.

Hypothesis 3. (H3):

Respondents who report the correct reason why the toll ring is introduced are more likely to be positive towards the toll ring.

In other words, this hypothesis is checking if people who are informed about aims of such projects still have a negative feeling (attitude) towards it.

First of all, to prove or disapprove this hypothesis, some general statistics have to be checked.

Table 22 on the next page is showing respondents` ratings of several probable explanations why the toll road is constructed. The respondents were supposed to rate the variants, where first place means that the reason is the most referable, while fifth position meant that the reason is least likely to be meaningful.

From the table below it is clearly seen that the variant "financing of future or ongoing road projects" was the most popular among the majority of respondents – most of them have prioritized it among other variants, and this variant was chosen in general on different positions by 343 people.

This is the first step to prove the hypothesis 2, and we can easily see that the majority of respondents know that financing of future or ongoing road projects is the main reason why the innovation was being introduced.

Table 22. Respondents` ratings
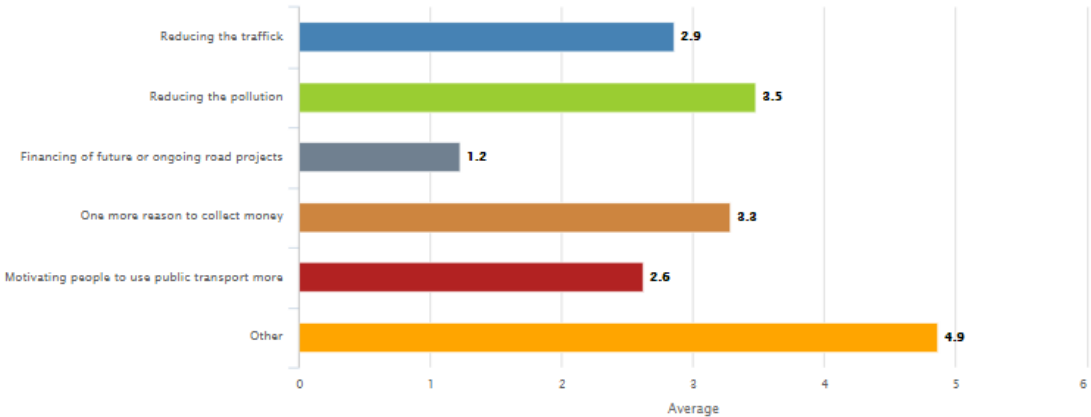
QUESTION	NUMBER OF RESPONDENTS
Reducing the traffick	162
Reducing the pollution	157
Financing of future or ongoing road projects	343
One more reason to collect money	134
Motivating people to use public transport more	194
Other	102

50

Formal recoding of the question was done, and in the outcome those people who have chosen this variant as the main variant were recoded as "1", the rest as "0".

In the result, 343 respondents of the questionnaire mentioned this variant in their answers, but only 294 citizens have chosen this alternative as the main reason why the tolls are installed. The results can be observed in the table 23 below.

In order to test the hypothesis, it is possible to correlate two variables "feelsnow" and "finans".

Table 23. The correct reason frequency

finans

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	84	22,2	22,2	22,2
	1,00	294	77,8	77,8	100,0
	Total	378	100,0	100,0	

Table 24. Correlation between attitudes and knowing the correct reason

Correlations

		feelsnow	finans
feelsnow	Pearson Correlation	1	-,045
	Sig. (2-tailed)		,400
	N	352	352
finans	Pearson Correlation	-,045	1
	Sig. (2-tailed)	,400	
	N	352	378

Two variables correlate by -,045, which is very low, and at the same time sig.,400 shows that the correlation is statistically insignificant.

Hypothesis 3 is going to be tested with regression.

Hypothesis 4. (H4):

Proper ex-ante information and clear purposes explanation from government related to the toll road implementation could make people's attitudes more positive.

First let us take a look at frequency data dedicated to Q22 "Do you think that your opinion about toll ring implementation could be better if there would be better information flow from the state?". The question was recoded to variable called "info", where 0 means "no" and 1 means "yes". As can be seen in the table below, 72% of people claimed that their opinion would not have changed if there were ex-ante information coming before innovation implementation (table 25).

Table 25. Opinion change by means of more information frequency

info

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	272	72,0	90,4	90,4
	1,00	29	7,7	9,6	100,0
	Total	301	79,6	100,0	
Missing	System	77	20,4		
Total		378	100,0		

Correlation model say that the relationship is negative, but does not have any strong significance. Pearson correlation is -0.078 and sig. Is 0.188 which is not statistically significant (table 26).

Table 26. Correlation between attitudes and opinion change by means of more information

Correlations

		feelsnow	info
feelsnow	Pearson Correlation	1	-,078
	Sig. (2-tailed)		,188
	N	352	287
info	Pearson Correlation	-,078	1
	Sig. (2-tailed)	,188	
	N	287	301

As an additional research, I decided to check what will happen when it comes to gender.

Women tend to be less positive about the toll ring as the innovation. Men are more positive than women by 0.038 with sig.0.482. The correlation is statistically not significant (table 27).

Table 27. Correlation between attitudes and gender

Correlations

		feelsnow	gender
feelsnow	Pearson Correlation	1	-,038
	Sig. (2-tailed)		,482
	N	352	344
gender	Pearson Correlation	-,038	1
	Sig. (2-tailed)	,482	
	N	344	370

Hypothesis 4 is going to be tested with regression.

Hypothesis 5a. (H5a): *People who report that the price for tolls is high are more likely to be negative towards toll ring.*

Hypothesis 5b. (H5b): *People who report that the price for tolls is high are more likely to change their behavior towards more negative.*

I decided to make one correlation table for these two hypotheses because price can influence both attitude and behavior. But, on the other hand, it is not convenient for analyzing and for regression if there will be different outcomes for both attitudes and behavior in one hypothesis – so for this occasion these hypotheses are represented as separate.

Looking at the correlation table below, we can see that even if respondents were reporting that the tariff for the toll ring is high ("price"), the number of passes still was going up with 0.276 and with the level of significance 0.01. At the same time attitudes towards toll ring were significantly going worse with 0.463 and the level of significance at the 0.01. The correlation is very significant, especially between the price and the attitudes (table 28).

So, in other words it means that even if people think that the price is high and they feel negative about the toll ring, they do not avoid using it, but at the same time their feelings are becoming more negative. It also can be concluded that those people who use the toll ring more than others think that the price is expensive and are more negative towards it than others.

Table 28. Correlation between price, attitude and behavior

Correlations

		price	behav	feelsnow
price	Pearson Correlation	1	,276**	,463**
	Sig. (2-tailed)		,000	,000
	N	341	326	321
behav	Pearson Correlation	,276**	1	,226**
	Sig. (2-tailed)	,000		,000
	N	326	355	332
feelsnow	Pearson Correlation	,463**	,226**	1
	Sig. (2-tailed)	,000	,000	
	N	321	332	352

**. Correlation is significant at the 0.01 level (2-tailed).

Hypotheses 5a and 5b are going to be tested with regression.

Hypothesis 6. (H6): *People with negative attitudes towards innovation are more likely to switch to another transport alternatives*

The table below shows that when people's attitude going worse, insignificant amount of people tend to change their behavior and switch to other transport. The relationship is very weak, and it is shown by Pearson correlation 0.013 and by sig.level 0.815. The correlation is not significant.

Table 29. Correlation between attitude and likelihood of switching to another transport

Correlations

		feelsnow	othertransport
feelsnow	Pearson Correlation	1	,013
	Sig. (2-tailed)		,815
	N	352	334
othertransport	Pearson Correlation	,013	1
	Sig. (2-tailed)	,815	
	N	334	359

Hypothesis 6 is going to be tested with regression.

Hypothesis 7. (H7):

People with negative attitudes towards the toll road and those who use it more are more likely to switch to electric cars

As an additional research I decided to check the frequencies for Q16 - "Do you plan to buy electric car in the nearest future?".

One of the alternatives how people could avoid paying for the toll ring was buying the electric car. Frequency table below (table 30) shows that among 262 respondents who gave answers to this question, only 17 (4,5%) decided to switch from the ordinary car to electric car due to the toll road implementation. Other 23 (6,1%) planned it before. All others are unsure about buying electro car or don`t need it at all.

This is a tentative hypothesis based on hypothesis 6 and assumptions based on the frequency observations. Also I considered the interconnection between attitudes and behavior and decided to include it in this hypothesis. I thought that even if correlation of hypothesis 2 said that frequent road users do not tend to switch to another transport mode, there nevertheless was additional question about electric cars.

Table 30. Plans to buy electric car in the future frequency

Do you plan to buy electric car in the nearest future?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, because of the toll-ring	17	4,5	6,5	6,5
	Yes, I planned it before	23	6,1	8,8	15,3
	I am unsure if I need one	42	11,1	16,0	31,3
	No, I don`t need electro car	180	47,6	68,7	100,0
	Total	262	69,3	100,0	
Missing	System	116	30,7		
Total		378	100,0		

Frequency table 30 showed that 17 people want to switch to electric cars. And hypothesis 6 states that people who feel negative about the toll road tend to switch to another kind of transport, even if statistically the result is not significant. Combining these two observations and the assumption that attitude and behavior are interconnected, we could arrive to the conclusion that frequent users of the toll ring who are more negative than others, could switch to electric cars.

If to run a correlation between the variables "feelsnow" and "elcar", we can see that the correlation is statistically significant at the 0,01 level, and it is 0.203. Which means that when people have a negative attitude, they more likely will switch to electric car.

It is also possible to observe from this correlation below that those who use toll ring more, are more likely to switch to electric cars. Correlation between "elcar" and "behav" is significant at level 0.01, and the level represented is 0,193. Look below for correlation table 31.

From the correlation results it is possible to conclude that these three variables are interconnected, and people who use the road often and those who feel negative tend to switch to electric cars.

Hypothesis 7 is going to be tested with logistic regression.

Table 31. Correlation between attitude, behavior and willingness to buy electric car due to the toll road implementation

Correlations

		feelsnow	elcar	behav
feelsnow	Pearson Correlation	1	,203**	,226**
	Sig. (2-tailed)		,001	,000
	N	352	244	332
elcar	Pearson Correlation	,203**	1	,193**
	Sig. (2-tailed)	,001		,002
	N	244	262	257
behav	Pearson Correlation	,226**	,193**	1
	Sig. (2-tailed)	,000	,002	
	N	332	257	355

**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis 8. (H8)*: After the implementation of the toll ring there is a drop in the number of passes*

This is also a tentative hypothesis concluded from the statistical results gathered by Statens Vegvesen.

According to statistical data that was been gathered during the whole year 2015 and first two months of year 2016, dramatical changes in car usage didn`t appear, but, nevertheless, changes exist.

The toll ring was first introduced on the roads on 15th October,2015. If to assume hypothesis 3 that people were supposed to avoid using the city innovation, then the numbers of passing through the toll-collectors were supposed to go down significantly. However, it is impossible to say that dramatic changes appeared. For example, on 13 and 14 of October 2015 in Jensvoll station there were 28199 and 28219 passers correspondingly. In the day of toll ring implementation, 15th of October, the number slightly changed to 26103 and then remained quite stable until the end of month. Talking about weekend trips, it is also difficult to say that there appeared tramendous changes – in general numbers didn`t change – they were quite stable and same comparing to the period before the toll ring implementation.

In general it is possible to say that after the toll ring implementation precisely 3000 passers disappeared – it may be that people decided to give up using the car at all, or maybe they cut down on using the car, or maybe they started to combine the trips.

However, if to check the numbers during 10 days before and after the implementation of toll road, it can be concluded that these 3000 passers may be nor significant in terms of one day and the whole city, but in general terms it grow up in big numbers.

For analysing the outcomes two main toll-stations were given – Jensvoll and Thallekrysset. The map can be seen in appendix, and the statistical data of passers also is attached there. Thallekrysset is passed more seldom than Jensvoll.

If to compute all passers for both stations during the period of 4-14 October, we will get numbers 269055 in total for Jensvoll and 226306 for Thallekrysset. For comparison, during 16-25 October both stations had 226306 and 115369 passers correspondingly.

It means that literally the numbers for Jensvoll dropped by 15,89% percent, and for Thallekrysset by 18,17% - which is quite a lot for a small city.

Table 32. Comparison table for Jensvoll and Thallekrysset

	10 days before	10 days after	Drop
Jensvoll	269055	226306	15,89%
Thallekrysset	140990	115369	18,17%

So, in the result, without using SPSS as a tool for analysis and operating only with statistical data gathered with the help of Statens Vegvesen, it is possible to conclude that there is a drop in number of passes through the main stations. Full data table in represented in appendix 2.

Hypotheses 8 is supported.

5.3 Regression analysis

And now, after considering correlations between variables, we will move to regression analysis. The overall table is represented below, and it is divided in models. Regression analysis will help us understand if hypotheses mentioned before can be supported or not.

Table 33. Regression table

	feelsnow	behav
	Model 1	**Model 2**
Control Variables		
gender	-0.015	0.065
Independent variables		
behav	0.098***	
finans	-0.034	
info	-0.113**	
price	0.423****	0,283****
feelsnow		
R square	0.230	0,08
Adjusted R square	0.214	0,074
F value	14.634****	13.624****

Notes:

Level of statistical significance: * indicates p<0.10, ** indicates p<0.05, ***indicates p<0.01, ****indicates p<0.001 (2-tailed)

Standardized regression coefficients (Betas) are represented in the table.

In the table above I represented 2 models. Model 1 includes variable "feelsnow" as dependent variable, and, as can be seen, it can be explained by such variables as "behav", "finans", info" and "price". These regressions were divided in separate hypotheses with corresponding correlations in the previous part "correlations". This model represents hypotheses 1, 3, 4, 5a. These hypotheses will be tested with the help of OLS-regression.

Model 2 is going to be included in the Model 1 analysis because it has only one interconnection which relates to hypothesis 5, and this hypothesis received a name hypothesis 5b.

Model 3 is not included in the table and represents variable "othertransport" as dependent, and it is influenced by "behav" and "feelsnow". This model tests hypotheses 2 and 6.

These two hypotheses also will be tested with logistic regression and the observation results will be written in slightly different manner comparing with the others.

Model 4 is also not included in the table – it will be observed separately. It will observe relationship between dependent variable "elcar" and two independent variables "behav" and "feelsnow", and this model is also going to be done with the help of binary logistic regression.

There will be one control variable for all models - "gender". We will see if gender influences the regressions in hypotheses.

- **Model 1 and Model 2**

First, I will observe model 1 because it includes in itself several interconnected hypotheses and, additionally, model 2 also will be included in the end of this part because It is directly related to hypothesis 5 and it is its extension.

Hypothesis 1. (H1): There is a connection between negative attitudes and number of passes.

This hypothesis is tested with linear regression between dependent variable "feelsnow" and independent variable "behav".

From the regression table above we can see that the regression equals 0.098 and it has $p < 0.01$, which means that there is statistically significant positive interconnection between these variables, even though the significance is not so big. It literally means that if the number of passes changes towards bigger amount, attitude will change towards more negative by 0.098. Or, in other words, people with more negative attitudes towards the toll ring use it more.

Hypothesis 1 is supported – there definitely is a connection between negative attitudes and number of passes.

Hypothesis 3. (H3): Respondents who report the correct reason why the toll ring is introduced are more likely to be more positive towards the toll ring.

This hypothesis is also tested with linear regression between dependent variable "feelsnow" and independent variable "finans".

Regression table shows that respondents who report the right reason why the toll ring is introduced tend to be slightly more positive towards it with -0.034. But this relationship is statistically insignificant.

Hypothesis 3 is not supported.

Hypothesis 4. (H4): Proper ex-ante information and clear purposes explanation from government related to the toll road implementation could make people's attitudes more positive.

Comparing to the results obtained in the correlation table in previous part dedicated to this hypothesis, we can see that back there the correlation seemed not statistically significant. But now, when the hypothesis is considered in terms of the whole model with several other variables, it became significant. Thus, the meanings that can be observed are -0.113 with $p < 0.05$. This regression says that in terms of the whole model, if people would have got more ex-ante information from the state, their opinion would change to a better one.

Hypothesis 4 is supported.

Hypothesis 5a. (H5a): Higher price can negatively affect attitudes.

The interconnection between price and attitudes is the strongest in this model 0.423 and it has the highest level of significance $p < 0.001$. When people find the price for passing through the tolls expensive, their attitudes become very negative.

Hypothesis 5a is supported.

Hypothesis 5b. (H5b): Higher price can negatively affect behavior.

This hypothesis related to model 2, but relates directly to previously mentioned hypothesis

Even if there is an interconnection between attitudes and behavior, it will be not right to connect these two hypotheses in one because we can get the result where price will influence these two variables differently.

Linear regression showed that price affects behavior by 0.283 and the relationship is statistically significant $p < 0.001$. The relationship is strong and it means that when price is

considered high, number of passes arises, or if to be more logic, those who use the road more think that the price is high than those who use it less often.

Hypothesis 5b is not supported – higher price does not negatively affect behavior.

Model 1 is explaining 23% of the variance, F value (14.634, p < 0.001) states that the model is relevant and significant. The model is not affected by gender with statistical significance. But men are discovered to be a little positive towards innovation than women.

Model 2 also have a significant F value (13.624, p < 0.001) and 8% of variance is explained by this model. Men were discovered to use the road more, but there is no statistical significance.

- **Model 3**

Models 3 and 4 are considered separately from others because it uses another method of regression – logistic regression. All the outputs from SPSS can be found in appendix.

Hypothesis 2. (H2): People who use toll road more are less likely to switch to another means of transport.

Direct logistic regression was performed to assess the impact of a number of factors

on the likelihood that respondents would report that they are ready to switch to another transport mode because they are using the road more. The model contained three variables ("gender", "othertransport" and "behav"). The full model containing all predictors was quite significant, $\chi 2$ (8, N = 331) = 14.808, p < 0.10, indicating that the model was able to distinguish between respondents who reported and did not report switching to another transport.

The model as a whole explained between 4,4% (Cox and Snell R square) and 6,8% (Nagelkerke R squared) of the variance in "othertransport" status, and correctly classified 77,3% of cases. As shown in Table "variables in the Equation" (appendix 2), variable "behav" have a strong significance p < 0.001. The predictor of reporting a "othertransport" issue was connected first of all with gender, recording an odds ratio of 1.594 with sig. 0.088. It means that in this model men are more likely to be ready to switch to another transport mode than women. Variable "behav" has an odds ratio of 0.742 (which is not so strong as gender) with sig. 0.001. It can be inverted, because it is less than 1.

After inversion we have 1,35, and it means that when the number of passes grows, respondents reporting that they switch to another transport more by 1,35.

For checking R square meaning I used Nagelkerke meaning because it is the most relevant and the most optimistic number. It says that this model explains 6,8% variance, but, nevertheless, hypothesis 2 is supported.

Full output can be found in Appendix 3.

Hypothesis 6. (H6): People with negative attitudes towards innovation are more likely to switch to another transport alternative.

Direct logistic regression was performed here as well to assess the impact of a number of factors

on the likelihood that respondents would report that they are ready to switch to another transport mode because they have negative attitudes towards innovation. The model contained three variables ("gender", "othertransport" and "feelsnow").

The full model containing all predictors was not significant, $\chi 2$ (2, N = 326) = 3.297, p > 0.10.

The model as a whole explained between 1% (Cox and Snell R square) and 1,5% (Nagelkerke R squared) of the variance in "othertransport" status, and correctly classified 78,2% of cases. As shown in Table "Variables in the Equation" (appendix 3), variable "feelsnow" does not have a significance. The variable "gender" have more influence on the dependent variable "othertrasnport" (p < 0.10) than "feelsnow". Literally, that is all we needed to check.

The hypothesis 6 is not supported.

Full output can be found in Appendix 4.

- **Model 4**

Hypothesis 7. (H7): People with negative attitudes towards the toll ring and those who use it more are more likely to switch to electric cars.

The same as in correlation analysis I consider veriables "behav" and "feelsnow" as interconnected variables and include them together in this model.

Direct logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents would report that they have planned to buy an electric car due to toll road implementation. The model contained three independent variables (gender, attitudes towards the toll ring "feelsnow" and behavior "behav"). The full model containing all predictors was statistically significant, $\chi 2$ (2, N = 240) = 14.02, p < .001, indicating that the model was able to distinguish between respondents

who reported and did not report an intention to buy electric car.

The model as a whole explained between 5,7% (Cox and Snell R square) and 16% (Nagelkerke R squared) of the variance in "elcar" status, and correctly classified 94,2% of cases. As shown in Table "variables in the Equation" (appendix 4), both variables make a statistically significant contribution to the model. The strongest predictor of reporting a "buying and electro car" issue was connected first of all with attitudes ("feelsnow"), recording an odds ratio of 2,885 with sig. 0.026. It means that those people who feel more negative towards the toll ring are more likely to buy electric car, than those who use it more often. Variable "behav" has an odds ratio of 1,613 with sig. 0.021. It can be observed in short table below.

For checking R square meaning I used Nagelkerke meaning because it is the most relevant and the most optimistic number. It says that this model explains 16% variance, but as was stated before, the explanation lies between 5,7% and 16%.

Table 34. Short logistic regression results for model 4

	elcar
behav	1.613**
feelsnow	2.885**
Nagelkerke R square	0.160

Notes: ** indicates p < 0.05

Taking in consideration, as I stated above, that two variables "feelsnow" and "behav" are connected to each other, I can make a conclusion that hypotheses 7 is supported, saying that definitely frequent road users with negative attitudes are more likely to switch to electric cars. However, attitudes have the strongest influence on this decision than behavior.

Hypothesis 7 is supported.

Full output can be found in Appendix 5.

5.4 Discussion

This research project was designed in order to investigate which attitudes people have and how do they behave towards innovation in the public sector – toll ring in Bodø. Toll-ring was considered as innovation due to its uniqueness in the city. The purpose of the work was to identify what exactly people feel about the innovation, would they think of it better if there would be ex-ante information from the flow, will the attitude influence the behavior in terms of car using and a decision to switch to another means of transport.

The research model can be observed in the research model part (figure 4).

Hypotheses 1, 3, 4, 5a are testing individuals` attitudes, hypotheses 2, 5b, 6, 7, 8 are testing behavior and the change in the behavior. The proposed research model helps to find answers to the core idea of this thesis by using primary data collected with the help of specially-designed questionnaire. With the help of quantitative research it was possible to reveal what people think about the toll ring and if they decided to stop using their cars and switch to another transportation mode.

Knowing answers to these issues will be a great benefit for Statens Vegvesen, because they can correct current work of the toll-stations if people would be negative about the toll ring, or the company can correct mistakes in future if there will be any.

To analyze the situation, tested hypotheses are represented below and discussed.

Table 35. Observation of hypotheses

Hypotheses	Support status
H1: There is a connection between negative attitudes and number of passes.	Supported
H2: People who use toll road more are less likely to switch to another means of transport.	Supported
H3: Respondents who report the correct reason why the toll ring is introduced are more likely to be more positive towards the toll ring.	Not supported
H4: Proper ex-ante information and clear purposes explanation from government related to the toll road implementation could make people`s attitudes more positive.	Supported
H5a: People who report that the price for tolls is high are more likely to be negative towards toll ring	Supported
H5b: People who report that the price for tolls is high are more likely to change their behavior towards more negative.	Not supported
H6: People with negative attitudes towards innovation are more likely to switch to another transport alternative.	Not supported
H7: People with negative attitudes towards the toll ring and those who use it more are more likely to switch to electric cars.	Supported
H8: After the implementation of the toll ring there is a drop in the number of passes	Supported

I will start summing up in numerical order.

Hypothesis 1. (H1)

There is a connection between negative attitudes and number of passes.

This hypothesis was based on the TPB(Theory of planned behavior) and as an outcome of TPB – PBC (perceived behavioral control).

TPB states that if a person have a negative attitude, then he(she) will be having a negative behavior. In our context it meant that if a respondent was answering that he(she) feels negative towards the toll ring, then the respondent will try to avoid using it, and as outcome number of passes will decrease.

In PBC I decided that the most relevant content was found in the concept of ATT (attitudes towards public transport), and I assumed that instead of ATT I can use the concept of attitudes towards innovation in public sector, and conclude that more positive attitudes will motivate PBC and promote more powerful perception of control over innovation.

The correlation analysis proved that there is a 0.226 correlation with high statistical significance sig.0.000. Correlation showed that the more people use the road, the less the like it.

Regression analysis supported the hypothesis with 0.098 and $p < 0.01$ and approved results of correlation – the more people use the road, the less they like it.

This was a surprising result because, logically and according to theory, if a person has a negative attitude towards innovation, he or she will try to use it less.

But in case of Bodø toll ring even if people have negative attitude towards innovation, they still use it without significant changes.

This happens, as was stated before, mostly because there is no alternative in the city and sometimes people can`t refuse to use their cars because it may be difficult to get to work without it, for example.

So, this is a bullet point for consideration – there has to be an alternative way for toll road users, but let us consider further what variants they can have as a probable variant for behavior.

Hypothesis 2. (H2)

People who use toll road more are less likely to switch to another means of transport.

Hypothesis was based on the concept of habit suggested by Nordfjaern et al.(2014) and Liu and Hong (2016).

These three authors stated that those who have a habit of using a car tend to have a negative attitude towards switching to public transport or to any other decisions connected with giving up on using their cars.

Correlation showed results of -0.181 and sig.0.001. It means that relationship is significant, and when people use the road more (or have a habit of using it), they do not switch to other transport alternatives. Logistic regression approved the results and showed B(exp) 0.742 and $p < 0.001$.

Theory is the same in practice and hypothesis is supported.

Hypothesis 3. (H3)

Respondents who report the correct reason why the toll ring is introduced are more likely to be more positive towards the toll ring.

The hypothesis was based on awareness concept suggested by Hord and Hall (1987) and Odeck and Bråthen (1997 & 2002). Three authors stated that users who have positive attitudes towards innovation were more likely informed previously by the authorities about the project. Hord and Hall (1987) said that there are several stages of concern that have to performed to get a positive outcome from the end-user, and Odeck and Bråthen (1997 & 2002) found in their researches that those people who received good information dedicated to the project and those who knew the purposes of road project had more positive attitudes than other users.

Correlation analysis showed that the result is not significant and the interconnection is really weak (-0.045 and sig.0.400). Regression model showed the same result, where Beta was -0.034 with $p > 0.10$.

So, there exists no positive relationship between knowing the correct reason of toll road construction and attitudes.

Probably it happens because of the absence of alternative way, as was also assumed above. It turns out that people have to use the road no matter what, they feel negative about it and they believe that the reason that is suggested by the state is not making attitude better.

Hypothesis 4. (H4)

Proper ex-ante information and clear purposes explanation from government related to the toll road implementation could make people's attitudes more positive.

The explanation to this hypothesis sounds somewhat similar to the previous one because it follows after the same theory part.

Correlation table showed -0.078 and sig.0.188. The correlation is not strong, negative and not significant, but regression model disapproves correlation results and shows Beta -0.113 and $p < 0.05$, which is more significant than correlation. The level of significance is different in these cases, and it has to be cautiously considered. Since the regression was considered in the model and was corresponded with other independent variables, I tend to believe that regression results were right and that proper ex-ante information would make attitudes better.

Hypothesis 5a. (H5a) Higher price can negatively affect attitudes.

Hypothesis 5b. (H5b) Higher price can negatively affect behavior.

Based on Kuester (1999) price sensitivity concept and Odeck (2010) toll rates.

Both authors found that when price is getting higher, users of a good or innovation tend to become more negative towards the product and switch to another alternative.

Correlation table showed the following coefficients for these three variables:

Price and attitudes have 0.463 and sig.0.000 which is very strong and statistically significant. The more people think that the price is high, the worse attitudes become.

Price and behavior have 0.276 and sig.0.000 which is also strong and significant, but not so strong as the correlation between price and attitudes. When the price is considered high, behavior changes, but to the side of more passes.

Literally, people who think that the price is high and have negative attitudes towards it, are actually frequent users of the road.

Regression analysis supports the correlation results.

Hypothesis 5a is supported with meanings 0.423 and p < 0.001, and hypothesis 5b is not supported with meanings 0.283 and p < 0.001, Both results are strong and significant, and it is concluded that higher price negatively affects attitudes, but at the same time those who think that the price is high still use the roll road.

This comes once again to the conclusion that people don`t have a choice even though they are getting angry towards the innovation.

Hypothesis 6. (H6)

People with negative attitudes towards innovation are more likely to switch to another transport alternative.

This hypothesis is also based on Kuester`s (1999) findings. She was saying that when people have a negative attitude towards a product (which is usually caused by the price increase), they tend to go to another seller. In this case I assumed that if we are talking about the roll road project, then another seller here will be another transport alternative.

If to check the correlation, it says that insignificant amount of people will switch to another transport alternative even if they feel negative towards innovation. It is shown by Pearson correlation 0.013 and by sig.level 0.815, the relationship is weak and insignificant. The same results were obtained by logistic regression analysis which stated that there is a weak significance level p > 0.10, which says that model does not work.

I believe that people with negative attitudes do not really switch to another transport alternative because they have a habit of using the car. Probably they do not switch because there is no transport alternative that could be convenient for them.

Hypothesis 7. (H7)

People with negative attitudes towards the toll ring and those who use it more are more likely to switch to electric cars.

As was stated before, this is a tentative hypothesis where I assume that attitude and behavior and interconnected (they really are), and if to take into consideration hypothesis 6 that people with negative attitudes switch to alternative transport modes, even if the meaning is insignificant, we can conclude that unsatisfied drivers could switch to electric cars.

Correlation table showed strong and significant results.

Both interconnections are significant at level 0.001, attitudes correlate with consideration of buying electric car by 0.203 and behavior correlates with it by 0.193. It means that in both cases if respondents were answering that they are considering to buy electric car, attitudes were becoming worse and number of passes were increasing. The same results were obtained with the help of logistical regression. Both Exp(B) were significant $p < 0.05$, and the model stated that negative feelings have more effect on decision-making process of buying electric car then the number of passes through the tolls.

Nevertheless, the hypothesis was supported. I presume that this outcome is appearing because people that are really unsatisfied with the new road policies (tolls) really want to pay less or do not want to pay at all. Buying electric car is a legal way of avoiding the payments for the road, and that is why significance is so strong – there is a clear observation that more probably people want to escape paying tolls.

Hypothesis 8. (H8)

After the implementation of the toll ring there is a drop in the number of passes.

This was also a tentative hypothesis based on the statistical data gathered by Statens Vegvesen, and it showed that there actually was a drop in the number of passes.

It means that all those insignificant that I was getting were probably connected with those people that, for example, decided to stop using their cars. In the whole model it seems insignificant, but when it comes to counting the actual numbers, then it turns out that numbers are changing in a quite significant way. As, for example, I was comparing the number of passes through Jensvoll and Thallekrysset 10 days before and 10 days after the implementation of the tolls, and it showed that actual numbers dropped for 15,89% and 18,17% correspondingly for both stations. The numbers can be low when it comes to one day, but if to take one specific period, then numbers are becoming much more significant.

To sum up, I can conclude that more probably respondents with negative attitudes are having a habit of using their cars. I believe that they face a problem of the absence of alternative, and that is the main reason why they are having negative attitudes. Knowing the reason why the toll road is implemented is not making the attitudes better, but slight interconnection exists between positive attitudes and proper ex-ante information flow from the state.

What is more, since they are driving more often, they start to notice that the price (that may seem adequate for a non-frequent user) is expensive. They do not switch to another transport mode such as public transport, because it can be that it may be inconvenient for them. There actually was a significant drop in number of passes after the toll road was implemented, but, nevertheless, the research was conducted mainly among respondents who possess at least one car and they still use it, and that is probably why some results obtained were so insignificant. A very strong significance was shown in relation to willingness to buy electric cars. Electric cars are the way to avoid paying tolls, and so that is why negative-thinkers are more likely to buy it – they want to avoid paying the price they consider expensive.

Also as a probable solution here, that I see could be done to decrease negative attitudes, some effective changes in public transport have to be made and maybe special tariffs for using the toll road have to be implemented taking in consideration time of the day and the average amount of passes per month that a specific user does.

6. Conclusion

Toll-road project in Bodø should be considered as innovation – it is something new for this city and for its` citizens. It is also supposed to bring value to its` users. In theory, implementation of toll road in Bodø was done to collect money for faster road construction, which could be difficult only with budget funding (Odeck and Bråthen, 1997 & 2002). Researches show that majority of toll roads end-users are aware of the true purposes of toll collections, however, some of them still have a negative attitude towards it (Odeck, 2010). Attitudes and behavior of citizens is the main topic of this paper, and theory related to attitude formation was applied.

Literature review showed that attitudes are usually formed unconsciously within human`s head. It is uncontrollable phenomenon which is influenced by experience, education, social environment, etc (Prihodchenko, 2003). However, attitudes can be influenced, and this can be used by public authorities to form a positive relation towards innovation. Theory of Planned behavior (Ajzen & Fishbein, 2000) was used in this case to formulate the hypothesis that states that negative attitudes can lead to negative behavior and, conversely, poitive attitudes lead to positive behavior. Some resources state that it is important to give information ex-ante, during and post-ante innovation implementation. Especially important is ex-ante information – it shapes trust among end-users (Hord and Hall, 1987). Odeck and Bråthen (1997 & 2002) noticed that people who know true purpose of the road project tend to have more positive attitudes towards it.

When it comes to behavior, people with negative attitudes are expected to avoid using the toll road (based on TPB). If the price is considered higher than expected, then users are also expected to change their behavior (Kuester, 1999; Odeck, 2010). However, respondents that have a habit of using a car (Liu and Hong, 2016) in theory are not expected to switch to another transport alternative, even if they are very unsatisfied with new road policies. As a tentative hypothesis, users of the toll road with negative attitudes are also expected to switch to electric cars because it is a legal way of escaping from paying the tolls. Also as a tentative hypothesis it was suggested that the number of passes dropped after the toll road implementation. This hypothesis was based on the statistical data collected by Statens Vegvesen.

In this thesis I considered 8 hypotheses, two of them were tentative hypotheses based on results gathered during the survey and analysis. Three hypotheses were not supported, in all other cases hypotheses were representing theory in practice.

The research uncovered some results that were not expected. Like, for example, it was expected that negative attitudes will be followed by the refusal of car use by respondents, but in the result most of the respondents that participated in survey did not refuse to use their cars.

It is also important to mention that people, the end-users, have a little choice regarding toll road in Bodø – most car-users have to use toll road because there is no way you can escape it. I assume that this is the main reason that forms negative relationship towards innovation.

The next negative point is price for tolls, and this is the second strong negative feature of toll ring in Bodø. Price is considered high by those users that use the toll ring most of all. As an outcome, they are the people who feel most negative about the innovation. As a way to avoid paying the toll collections people are willing to buy electric cars. Some of them considered buying it before, but in the research I was analyzing the answers of those who wanted to switch due to the toll road implementation. The overall amount of people was not so big, but the results obtained had really strong significance and they proved that people with car habit who use the toll road very often, and are really negative about it and that probably think that the price is high are more likely to switch to electric cars.

Also it was found in this research that knowing the purpose of the toll road construction does not make people's attitudes better, but respondents admit that ex-ante information would make their attitudes slightly better.

6.1 Limitations of the research

The main limitation of this research is connected with the problem that 90% of the respondents work in the public sector. It means that other groups of respondents that live in Bodø were not considered well enough and their opinions are not represented in this thesis. When doing a correlation and regression analysis, I was getting some insignificant numbers, and I think it was dedicated to the problem that not all groups of the respondents were represented. Although, when I was considering statistical data obtained by Statens Vegvesen, they found that actual number of car passes dropped since the moment of toll ring implementation.

For one station the numbers fell by almost 18%, and it is quite significant for the city. I believe that if there existed some other way of spreading the questionnaire (like for example posting the link on the official administration web site of the city), then results obtained would be wider and more descriptive.

What is more, opinions of some respondents could be biased because they could be directly connected to the project, and as an outcome they could have written the opinion that is "the right one", but not the opinion that exactly they have.

6.2 Further research

This master thesis can be a good basis for further research, because the outcomes of such projects can be studied not only after a short time after the implementation but also after a year, two or more. First, the bigger audience can be researched, and maybe if the tendency of buying electric cars will grow further, then the new outcomes of the research can be found.

Also there could be a lot of topics for discussion based on the theory that I obtained. For example, "is it possible that too much participation of citizens in city-projects discussions will lead to nothing just because it will be difficult to find a consensus for everybody?" Or: "Which kind of information people are willing to see when it comes to implementing innovation that will change their daily routine?"

Or, what is also relevant, discussions on the topic of forced behavior can be done because this concept was not observed here but it is very meaningful since there is no alternative way for car users.

I believe that the topic of public sector innovation have a lot of gaps which can be fulfilled to make it more obvious and developed.

This research can be very useful for the authorities who implement such kinds of innovation into people's daily lives: maybe if during the research it will be proven that good information provision is necessary to make people think positively, this will be taken in consideration next time and road-projects will be met with enthusiasm by their end-users. Or maybe there will be opened alternative free road for those who do not want to pay, or maybe some changes in the public transport policies will be made. Also as a solution here I see special tariffs for users who drive often and maybe special tariffs according to the time of the day (morning, night, etc.)

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Appendix 1

Original questionnaire for the research

Q1. What is your gender?
1 – Male
2 - Female
Q2. What is your age?
1 – Under 18
2 – 18 - 24
3 – 25 - 35
4 – 36 - 45
5 – 46- 55
6 – 56 - 65
7 – 66 or more
Q3. What is your occupation?
1 - Employed in the public sector
2 - Employed in the private sector
3 - Student
4 - Pensioner
5 – Self-employed
6 - Other
Q4. Do you (or your family) have a car?
1 – Yes, one
2 – Yes, several
3 - No
Q5. Do you plan to buy a car in the nearest future?
1 – Yes
2 – Yes, electric car
3 - No
Q6. Did your family use all the cars before toll-road implementation?
1 – Yes
2 - No
Q7. Do you still use all the cars(after the toll-road implementation)?
1 - Yes, we use all the cars
2 - Partly, we use one car more than other(s)
3 - No, we use only one car now
4 - No, we don`t use our cars now
Q8. Is it still the same for you, when the toll-ring is introduced?
1 - Yes, we use the same amount of cars
2 - No, we cut down on using the cars
3 - No, we now use more cars
Q9. Is it the old car or you decided to buy electric car?
1 – Old car
2 – Electric car
Q10. Did you decide to buy electric car because of the toll-road implementation?
1 – Yes
2 – No, I have another reason
Q11. Do you still use your car(after the toll-road implementation)?
1 - Yes, everything is the same
2 – Yes, but less often
3 – No, I don`t use it

Q12. How many times a week(on average) you pay for passing through the toll ring?
1 – 1-2
2 – 3-4
3 – 5-8
4 -9-12
5 – 13-20
6 – 21-26
7 – more than 26
8 – None
9 – I don`t know
10 - Other

Q13. Which alternative you have chosen?
1 – Bus
2 – Bicycle
3 – Walk
4 – Travel together with somebody
5 - Other

Q14. Is it possible to say that since the toll-road implementation you started to use other kinds of transport more?
1 – Yes
2 – No
3 - I don`t know

Q15A. How do you usually reach your destination?:Bus
0 – false
1 - true

Q15B. How do you usually reach your destination?:Bycicle
0 – false
1 – true

Q15C. How do you usually reach your destination?:Walk
0 – false
1 - true

Q15D. How do you usually reach your destination?:Travel with somebody
0 – false
1 - true

Q15E. How do you usually reach your destination?:Other
0 – false
1 - true

Q16. Do you plan to buy electric car in the nearest future?
1 - Yes, because of the toll-ring
2 - Yes, I planned it before
3 - I am unsure if I need one
4 - No, I don`t need electro car

Q17A.What do you think is the main purpose of building the toll-road?: Reducing the traffick
0 – fasle
1 - true

Q17B. What do you think is the main purpose of building the toll-road?: Reducing the pollution
0 – false
1 - true

Q17C. What do you think is the main purpose of building the toll-road?: Financing of future or ongoing road projects
0 – false

1 - true

Q17D. What do you think is the main purpose of building the toll-road?: One more reason to collect money

0 - false

1 - true

Q17E. What do you think is the main purpose of building the toll-road?: Motivating people to use public transport more

0 – false

1 - true

Q17F. What do you think is the main purpose of building the toll-road?: Other

0 – false

1 - true

Q18. How did you feel when you discovered that the toll-ring is going to be built?

1 – Positive

2 – Indifferent

3 – Negative

4 – I don`t know

5 - Other

Q19. How do you feel about it now?

1 – Positive

2 – Indifferent

3 – Negative

4 – I don`t know

5 - Other

Q20. Can you explain shortly why such changes occurred?

(text answer)

Q21. Can you explain shortly why you feel so negative about it?

(text answer)

Q22. Do you think that your opinion about toll-ring implementation could be better if there would be better information flow from the state?

1 – Yes

2 – No

3 – I don`t know

Q23. Do you think that the tariff for using the toll-ring is expensive?

1 – Yes

2 – No

3 – I don`t know

Q24. Do you use auto-pass?

1 – Yes

2 - No

Q25. Do you live inside or outside toll-ring?

1 – Inside

2 - Outside

Q26A. What is your purpose of passing through the toll-ring?:Work

0 – false

1 - true

Q26B. What is your purpose of passing through the toll-ring?:Studies

0 – false

1 - true

Q26C. What is your purpose of passing through the toll-ring?:Shopping

0 – false

1 - true

Q26D. What is your purpose of passing through the toll-ring?:Driving kids to kindergarden/school / other

0 – false

1 - true

Q26E. What is your purpose of passing through the toll-ring?:Other

0 – false

1 - true

Q27. Is it possible to say that you are trying to combine trip purposes? F.ex. you pass through the toll-ring and you take your kids to/from the kindergarden and at the same time you do shopping for saving up time and money?

1 - Yes, I combine trip purposes

2 - No, I don`t do that

3 - Other

Q28. Did you act the same before or is it your new habit?

1 - It was the same

2 - This is my new habit

3 - Other

Q29. How satisfied you are in general with toll-ring implementation?

1 - Very Unsatisfied

2 – Unsatisfied

3 – Indifferent

4 – Satisfied

5 – Very satisfied

Appendix 2

Statistical data obtained by Statens Vegvesen

Cymma - Antall — År 2015 (dag)

Sted	Måned	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	2015 Pe
JENSVOLL	(sum)	247811	281923	274099	274621	273852	278369	279103	281327	293888	277350	294203	301392	280797	288648	309205	301766	291857	290487	294934	286680	278200	276988	259643	282785	285687	277761	246757	265308	145263		##	##
	1	11397	21560	16162	14304	24372	24007	25342	25153	15825	17878	15316	26049	25309	26269	26874	25583	17192	15854	25983	26089	26445	26437	16821	15432	25999	25663	25926	25857	17774			693733
	2	16080	26008	26250	26146	25995	26007	15992	12652	25320	26593	26544	26269	27004	27192	26672	26740	17275	14937	26216	26291	16854	24972	14157	23482	22591	15525	25991	24375				631308
	3	15436	26864	27082	27082	21589	26576	16623	19403	27250	27250	27461	27375	18822	18876	27807	27636	28419	28216	27382	27382	17228	18592	28053	28687	28960	27692	29293	17157	13978	22027	21284	745509
	4	18282	9918	11758	12934	16423	27761	27465	27839	27510	20745	17650	28285	28136	28885	27807	27764	19492	17476	28216	28427	28412	27915	28888	28053	19338	30142	30142	30661	13978	22027		709183
	5	16172	19236	18352	11758	16423	29467	29708	28796	21134	21256	17145	30204	31971	27280	28885	20957	19492	29117	29289	28491	29109	16057	19062	19338	30743	28897	30085	18771				717530
	6	28947	28359	29103	28152	29218	19873	29708	27826	29974	29391	30230	18935	29920	29351	29117	30475	28915	28273	29542	18340	21515	21398	28616	21058	21166	30743	21630	22187			18771	778547
	7	26259	25611	24313	17296	16644	24691	18964	28487	23932	24432	15498	23200	27707	22559	22255	15776	15207	28915	21635	20889	21515	25830	28016	15781	15463	17222	26782	26035	22187			656435
	8	17225	16245	24619	24313	24264	24264	23627	17830	27203	26305	27715	28458	27668	20495	29079	28345	28896	27321	26779	17661	19253	28998	28603	28171	21155	21165	21600	21606	29152	22187	18771	745483
	9	28623	28704	27251	18529	17710	28677	28153	28608	28153	28281	28281	27872	27883	28154	27872	18286	18237	27321	28942	28005	27490	28994	27105	29293	28930	28400	27516	28166	21630			766495
	10	28268	27706	19324	17036	28420	28228	27309	24348	25891	16485	26466	28199	26103	26644	26103	25725	25417	27420	26079	25830	25830	26275	26861	16339	26263	25935	18628	18528				744890
	11	16207	25720	25510	28420	28228	25241	17811	25609	25469	25655	27107	27107	19194	16366	19194	26992	25992	26665	26665	16696	14468	25547	25958	26023	26791	16401	26263	26135	18528			695755
	12	24915	26002	25721	26073	18220	16882	23434	25378	26737	26842	26842	19072	17251	25938	26314	26314	27224	27066	19851	17636	28121	27226	23746	12556	9020	11894	13328	19601	19978	17567		672570
Thallekrysset	(sum)	101235	119600	111796	113044	114511	113929	97951	86308	116336	116489	112292	123998	125921	121710	111280	115403	122908	123111	138731	138657	129013	121796	131311	132879	116814	123121	131131	129289	116332	120978	56493	##
	1	7926	14693	14855	14681	14769	14728	8143	3426	9956	9955	7122	15038	14738	14459	14808	14576	10300	7588	14687	14665	14962	14869	10462	7465	14763	14941	14475	14806	15319	10540		288526
	2	7650	14855	15008	14893	15182	15204	8220	14885	15099	14379	14478	14833	15105	11266	8187	15432	7588	14616	15058	15168	14962	14763	14869	10462	14591	14428	13667	14562	11168	8008	15512	361778
	3	10156	4844	4579	6186	6024	7135	11423	15099	14885	15099	15027	15740	16673	11219	8923	15288	15244	15255	15706	11044	8491	15521	15394	16324	15747	16324	13407	15457	12827	12665		416729
	4	7737	10758	8030	15783	15669	15716	15587	15687	15979	15979	11746	13763	15319	16018	15649	16043	16043	11239	7994	15643	15542	15796	16848	16858	10963	16280	15552	16034	17228			375404
	5	15999	15980	15908	15944	16296	11189	15947	8040	8542	16609	15816	17070	8061	15905	15649	7994	11396	15034	15816	16440	16606	5506	16858	7283	7962	16635	16794	16366	11435	8328		391232
	6	15161	15077	14424	9770	7533	13950	13947	14441	16356	14296	18404	17334	8914	16982	16401	16728	16739	15323	15816	10703	8022	15833	15209	7398	7283	16438	10105	8030	14962			434388
	7	15161	15077	14424	9770	13950	13947	14441	15758	16609	14010	18404	17334	16256	8914	191	9551	16728	16739	16685	10703								191				169285
	8	14800	14849	15002	14843	10540	7616	14860	14208	13611	8910	7117	14925	14562	14082	13594	14082	14660	14717	14968	16109	16696	8282	8365	14410	14765	9530	14765	5325		15512		211214
	9	15070	14994	10812	7306	15147	15263	14208	13611	8910	8910	7117	14925	15181	13594	14082	10408	7374	14717	10140	7546	14488	14508	13324	14410	10057	14317	13757	14984	13851			237711
	10	6736	13550	13352	13632	13351	13128	9735	13185	13006	13006	13319	14185	13691	9688	13275	13094	13599	14352	13933	13933	13268	13513	13855	13243	14079	13724	13219	13851	13611	9648		383325
	11	6736	13550	13352	13632	13351	13128	9735	13185	13006	13319	13319	14185	13691	9688	13275	13094	13599	14352	13933	13933	6616	13243	14079	13724	14169	14945	10501	7404	12737	9648		359675

Appendix 3

Full output of logistic regression for hypothesis 2

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	331	87,6
	Missing Cases	47	12,4
	Total	378	100,0
Unselected Cases		0	,0
Total		378	100,0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
,00	0
1,00	1

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			othertransport		Percentage
Observed			,00	1,00	Correct
Step 0	othertransport	,00	256	0	100,0
		1,00	75	0	,0
	Overall Percentage				77,3

a. Constant is included in the model.

b. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1,228	,131	87,428	1	,000	,293

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	behav	11,777	1	,001
		gender	2,407	1	,121
	Overall Statistics		14,684	2	,001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	15,016	2	,001
	Block	15,016	2	,001
	Model	15,016	2	,001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	339,232[a]	,044	,068

a. Estimation terminated at iteration number 4 because
parameter estimates changed by less than ,001.

Classification Table[a]

			Predicted		
			othertransport		Percentage
Observed			,00	1,00	Correct
Step 1	othertransport	,00	256	0	100,0
		1,00	75	0	,0
	Overall Percentage				77,3

a. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	behav	-,298	,087	11,850	1	,001	,742
	gender	,466	,274	2,905	1	,088	1,594
	Constant	-,496	,335	2,193	1	,139	,609

a. Variable(s) entered on step 1: behav, gender.

Appendix 4

Full output of logistic regression for hypothesis 6

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	326	86,2
	Missing Cases	52	13,8
	Total	378	100,0
Unselected Cases		0	,0
Total		378	100,0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
,00	0
1,00	1

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			othertransport		Percentage
Observed			,00	1,00	Correct
Step 0	othertransport	,00	255	0	100,0
		1,00	71	0	,0
	Overall Percentage				78,2

a. Constant is included in the model.

88

b. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-1,279	,134	90,790	1	,000	,278

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	gender	3,090	1	,079
		feelsnow	,150	1	,699
	Overall Statistics		3,266	2	,195

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	3,297	2	,192
	Block	3,297	2	,192
	Model	3,297	2	,192

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	338,415[a]	,010	,015

a. Estimation terminated at iteration number 4 because
parameter estimates changed by less than ,001.

Classification Table[a]

	Observed		Predicted		
			othertransport		Percentage
			,00	1,00	Correct
Step 1	othertransport	,00	255	0	100,0
		1,00	71	0	,0
	Overall Percentage				78,2

a. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	gender	,483	,275	3,086	1	,079	1,621
	feelsnow	,069	,164	,176	1	,674	1,071
	Constant	-1,695	,411	16,998	1	,000	,184

Appendix 5

Full output of logistics regression for hypothesis 7

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	233	61,6
	Missing Cases	145	38,4
	Total	378	100,0
Unselected Cases		0	,0
Total		378	100,0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
,00	0
1,00	1

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			elcar		Percentage
Observed			,00	1,00	Correct
Step 0	elcar	,00	219	0	100,0
		1,00	14	0	,0
	Overall Percentage				94,0

a. Constant is included in the model.

b. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-2,750	,276	99,514	1	,000	,064

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	gender	,943	1	,332
		feelsnow	7,798	1	,005
		behav	7,030	1	,008
	Overall Statistics		13,429	3	,004

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	15,718	3	,001
	Block	15,718	3	,001
	Model	15,718	3	,001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	90,159[a]	,065	,179

a. Estimation terminated at iteration number 7 because
parameter estimates changed by less than ,001.

Classification Table[a]

			Predicted		
			elcar		Percentage
Observed			,00	1,00	Correct
Step 1	elcar	,00	219	0	100,0
		1,00	14	0	,0
	Overall Percentage				94,0

a. The cut value is ,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	gender	-,714	,587	1,478	1	,224	,490
	feelsnow	1,082	,467	5,377	1	,020	2,951
	behav	,509	,214	5,665	1	,017	1,664
	Constant	-6,912	1,521	20,652	1	,000	,001

a. Variable(s) entered on step 1: gender, feelsnow, behav.