MOBI PROMOTING SMART MOBILITY TO EMPLOYEES

Feedback on MOBI results and lessons learned

Final report

Project: MOBI – Promoting smarter mobility to employees		Contract number: IEE/12/738/SI2.644749
Type of report: Deliverable		http://www.mobi-project.eu
Project Duration: 08/03/2013 – 07/03/2016	Report date: 01/03/2016	Status of Deliverable: Final
Project coordinator: Sander Buningh, DTV Consultants		
Author: João Bernardino and Mafalda Mendes Lopes, TIS – Consultants in Transport, Innovation and Systems		
Quality check by: DTV Consultants		

Co-funded by the Intelligent Energy Europe Programme of the European Union

Contents

Co-funded by the Intelligent Energy Europe Programme of the European Union

Co-funded by the Intelligent Energy Europe Programme of the European Union

1 Objectives and methodology

From5To4 is an online serious game which has the aim of promoting sustainable forms of mobility to employees for their commute to work. Gamification is a trend applied over the past decade in many fields with the objectives of changing behaviour, teaching and training, raising awareness or providing peer-to-peer encouragement. The reason why gaming has been increasingly applied is that it tends work, sometimes better than any other strategies, in achieving the objectives.

This report provides feedback on the results of the campaign, From5To4, and provides a detailed analysis with some lessons learned for the MOBI project's local implementers and supporters. This report follows the guidance of the Max-Sumo evaluation approach, as described in the MOBI Evaluation Plan. This approach is based on dividing the complex process of behavioural change into smaller steps that can be successively monitored and evaluated. Therefore, the evaluation does not only look at the final results, but tries to identify the failures and successes at every stage of the process. It is broadly split into three assessment levels:

1. Assessment of Services Provided
2. Assessment of Mobility Options Offered
3. Overall Effects

In the MOBI project, the "service" in cause is the From5To4 game which organisations introduce to their employees[1].

The Assessment of From5To4 covers the activities and outputs of the MOBI project in terms of the From5To4 game development, communication activities and recruitment of organisations, the awareness of the initiative, the level of adoption of From5To4 and the satisfaction of its users.

The assessment of mobility options focuses on the *behaviour change* achieved by the application of From5To4, looking at various phases of behaviour change (Acceptance, Take up and Satisfaction with mobility alternatives).

The third level of assessment focuses on overall effects, covering the long-term attitudes and behaviour of the From5To4 players, and the system impacts, which focus on CO_2 savings and health (calorie consumption is used as a proxy for health).

The sources of data applied for this assessment are:

- The *data* provided by the From5To4 game – this included data on the activity of players and their mobility options before and during the game;
- A *baseline questionnaire* characterising the situation of organisations playing the game;
- A *final questionnaire* to players of the game about their satisfaction and use of From5To4 game and alternative modes of transport after the end of the game;
- The qualitative feedback of the MOBI staff across all sites on the following subjects, considering their experience in the MOBI project:

[1] See the MOBI Evaluation Plan for details on the adaption of the MaxSumo approach to project MOBI.

Co-funded by the Intelligent Energy Europe Programme of the European Union

- What are the main factors that make organisations want to play F5T4?
- What are the reasons some organisations are not interested in playing F5T4?
- What works to build the players' interest in the game and what doesn't?
- What factors contribute, or not, to make players change mobility behaviour?

The From5To4 games covered in this assessment include country campaigns from six countries. Each campaign is at a different stage of the implementation process and the data presented and assessed reflects the status of each game. The game activity and behaviour change data include unfinished games (each game runs for a 1 to 6 month period determined by the organisation playing the game). The results of the final questionnaire are only available for some organisations. Some Bulgarian games were not included in the quantitative assessments since they focused on short games realised during single events, which are not comparable with the other games. Likewise, the UK campaigns formed part of the development and refinement of the tools phase before the evaluation process had been defined.

Co-funded by the Intelligent Energy Europe Programme of the European Union

2 Assessment of From5To4

2.1 Activities and outputs

The MOBI project has completed the different phases of development, including: recruitment of organisations, playing the game and evaluating the results.

The following tables show the campaigns that have taken place to date, concerning games with more than 500 trips filled in. The table highlights how many organisations were recruited, total number of employees and number of employees who were invited to play the game.

Table 1: Number of engaged organisations and players

	Belgium	Bulgaria	Netherlands	Portugal	Romania	**Total**
Organisations playing	6	2	3	4	9	**24**
Invited employees	361	36	840	187	483	**1907**

The game is currently fully functioning and available for organisations to implement within their workplaces. The games have had periods of gaming between one and six months. However, the total number of organisations and players participating in the game are below the targets. There are two different explanations that can be used to justify the low target levels:

The first issue was related to the development of the tool. The length of time it took to refine the initial tool, translate it into several different languages and make further refinements took longer than anticipated to complete. This was caused by several aspects, including larger than anticipated technical difficulties in the implementation of the tool and the need for several iterations among the consortium team and the tool developer regarding the functionalities of the tool. The latter difficulty is partly caused by the involvement of several different entities in this process. One lesson that was learned was to ensure any future development of similar tools is carried out by one of the project partners, rather than through a sub-contractor agreement with a third party. Other benefits of such an arrangement would also include the ability for the other project partners to have a direct input into the development of the tool, better understanding of the limitations of the tool first hand and an ability to quickly respond to any issues or constraints.

A second constraint is that all local partners experienced difficulties in the recruitment of participating organisations. Because the tool is relatively new, it can take a long time before a contact will actually generate a game. This could take between six months and a year to come to fruition. Many of the companies that were approached at the beginning of the game, regardless of which country they are based, spent a considerable amount of time trying to seek internal approval to test the game with a small group of employees. A revised recruitment plan led to examples of different scenarios, which describe angles to approach potential F5T4 participants. The country specific plans contain different scenarios to reflect the cultural differences between different countries. In addition to changes made to the recruitment strategy, additional efforts to recruit new organisations have also taken place. Some partners have focused their efforts on targeting international companies that have a presence within two or more participating countries. Encouraging multi-national companies to play the game within their own organisation, across their different European offices at the same time, may result in higher levels of participation.

Co-funded by the Intelligent Energy Europe Programme of the European Union

A third constraint relates to the difficulty of engaging the employees even after the organisation has decided to play the game. Either due to a poor communication, to lack of motivation or charisma of the person responsible for the game within the organisation, or to a simple lack of interest from the employees, the fact is that some companies abandoned the game after failing to engage a sufficient number of employees. Some companies such as Joker solved this problem by making the game mandatory.

2.2 Awareness of the From5To4 game

The From5To4 game has been directly presented to more than 300 organisations to date. These include private companies, public authorities and universities. Umbrella organisations or other stakeholders potentially interested in promoting From5To4 to their contacts were also approached.

The local MOBI staff has been using different strategies to identify and engage organisations. In several countries these strategies were adjusted following the experience with the initial strategy. The following approaches have been reported:

Promotion via local authorities – In the Netherlands, Belgium, Portugal and the UK, an approach used to promote the game was to initially present it to a local authority that showed an interest in promoting the game to organisations within their local area. For example, this was tried in Rotterdam, Truiden, Antwerp, Torres Vedras, JF Alvalade, Edinburgh City Council and Fife County Council. However, in practice, this approach did not result in a high level of recruitment take up.

Promotion via other interested stakeholders – In Portugal, Belgium, Romania and the UK attempts were made to promote the game also via umbrella organisations or stakeholders with an interest in promoting the game. For example, local Chambers of Commerce, Business Council for Sustainable Development, public transport operators, cycling associations, Business Improvement Districts (BID) and Business Parks were all approached. Also this approach did not result in new organisations being recruited.

Direct contact with companies - Directly approaching companies has been the most successful strategy, even though it is also the most resource consuming method. Experience has shown the best way to engage with companies directly is via an internal contact and not via the organisation's general contact details. In each company, the job title of the most relevant individual to approach may vary and it may be worthwhile to target several individuals at the same time (see next section for further details).

Press releases, newsletters, adds, media appearances – Submitting articles for external publication was an approach that was followed by several countries. This approach did not generate any significant results, even though there have been some interest received from organisations wanting to find out more information on the back of these communication channels.

Social media – MOBI is available on Facebook in Europe as a whole, Bulgaria and Portugal. Following some paid advertising, the Portuguese page became liked by +500 people. No cases of recruitment have yet resulted from this approach.

Events – MOBI has been presented at national and local events. In Bulgaria, several events were used to realise mini-games. In Belgium, the first trigger for contacts was the series of four local launch events that coincided with the Car Free Day launch events. In Portugal, a presentation about the ANA Airports' game was delivered at a national event on Transport Innovation. The presentation was well received and this led to several new contacts being generated. In the UK, a

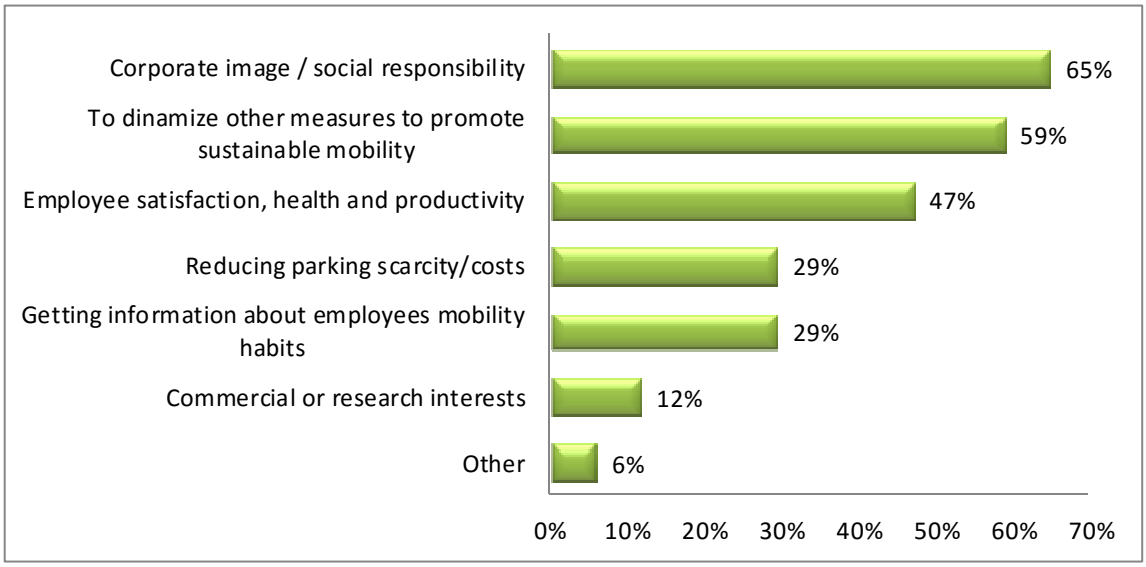
Co-funded by the Intelligent Energy Europe Programme of the European Union

local transport group headed by South East Scotland Transport (SESTran) (10 employers, including universities, NHS Sustrans and networking organisations attended) resulted in engagement with one organisation and a presentation at a ACTTravelwise meeting (15 major employers from across the south of England attended) also resulted in contacts who offered to promote the campaign to their businesses.

2.3 Usage of the From5To4

Organisations

When recruiting companies, it was important to understand which triggers could be used to interest them in the game and the main reasons why they would want to play



(Figure 1). From the baseline questionnaires (17 completed surveys), it shows that the most stated reason from organisations related to improving corporate image / social responsibility with 65% of organisations providing this as their main response. This was followed by the intention to boost other measures to promote sustainable mobility (59%) and improve employee satisfaction, health and productivity (47%). Reducing parking scarcity or costs and getting information on the mobility habits of employees has also been stated by 29% of the respondents.

Co-funded by the Intelligent Energy Europe Programme of the European Union

Figure 1: Reasons for organisations to participate in the game

- A clear lesson from these results and from the experience of the MOBI partners in dozens of presentations or meetings towards potential players is that **companies generate an interest in (or lack of) From5To4 for very distinct reasons –** there's no one approach that fits all. For example, in Belgium, the company Joker focused on sustainability issues as their key motivation to encourage staff to participate. Their aim was to achieve a reduction in CO_2 regardless of how people played the game. For the company Floordam the health aspect was the most important. This organisation was mostly interested in active modes and how many calories were burned as a result. Similarly, in the UK, the University of Edinburgh tested the game because it wanted to use the monitoring results to update their workplace Travel Plan. There is no specific approach that fits all organisations and a key requirement by recruiters is to identify the main priority. In Portugal, an aspect that contributed to several companies not playing the From5To4 game was that they felt they had not previously provided better conditions for their employees to enable them to choose alternative modes of transport and therefore should not ask them to change behaviour. However, although the lack of dedicated facilities or information in ANA was also a factor, this didn't stop the company from playing the game and it was perceived as a very successful experience by players and staff. This indicates that other companies could potentially have played the game if they were directed to see the potential benefits of the game from a different perspective. To better target the messages to potential players, before a meeting or presentation takes place, it may be useful to carry out some research into the organisation to find out more information about their profile and the objectives of the responsible staff in order to choose the right messages to that target.

Some key elements of the organisation that may be considered in advance for defining the targeting of messages are:

- External and internal social responsibility profile of the organisation
- Human resource policies
- Sustainable mobility policies, including availability of sustainable mobility facilities and information
- Accessibility of different modes of transport to the site
- Responsibilities and motivations of the contact persons (motivation of the responsible staff is crucial)

Co-funded by the Intelligent Energy Europe Programme of the European Union

- Openness to innovative initiatives

The large number of contacts made with companies also identified the most common reasons why companies did not engage with From5To4. The local MOBI staff members identified the following reasons:

- Fear that the game will not be a success among employees, contributing to a bad image of the organisation
- Action not aligned with organisation's priority initiatives in CSR and/or HR
- Low interest shown by employees
- Lack of prior initiatives by the company to improve the conditions/facilities for adoption of sustainable mobility alternatives
- Restricted access to internet
- Large companies, outside the city, already operate transport services for their employees
- Small companies do not feel any obligation to have a sustainable transport plan for their employees
- Long duration of the game deters some companies
- Competition with other similar actions (campaign-fatigue)
- Tool is not flexible enough to be personalised by individual companies

Players

There have been different reasons identified by the MOBI local staff on what kept players interested in the game. The most important factor is the attitude towards, and concerns about, environmental sustainability issues. Understanding the motivation of employees to participate in the game is also a key priority. Those who are personally interested in environmental issues are more likely to register to play the game. Another important motivation is the team based element of the game that encourages peer-to-peer support and influence to ensure all team members are recording their details. The results of the ANA game showed how team members spent time with each other first thing in the morning discussing the game, how they were doing in the competition and motivating each other.. Whether the gaming elements are sufficient (or not) to maintain motivation in the game is something that varied across organisations. In ANA, the coordinating staff reported positively about this and had the opinion that no further motivation was necessary during the four month period. However, Joker (Belgian company) employees preferred extra communication materials, offline incentives and rewards to make sure the momentum of the game was achieved. The competition element appears to work best with players who already travel sustainably some days of the week or who show enthusiasm towards changing their behaviour; this might be male players cycling (Joker) or female players carpooling (ANA). Several organisations provided prizes to players as a motivating factor under the belief that this would attract a higher number of players.

Of the **employees** invited to play across all countries, 31% actually **participated** in the game. This percentage varies a lot from organisation to organisation, from 2% (Nokia) to 98% (Joker). Following from the elements described above, there are some practical factors which have shown to influence this level of participation among invited employees:

- **Compulsory participation**: when the organisation's administration presents the participation in the game as compulsory or expected from the part of employees, then the rates are much higher, between 50% and 100%. This has been the case in the JOKER game (BE) with nearly 100% participation.

Co-funded by the Intelligent Energy Europe Programme of the European Union

- **Message to invited employees**: This option has the lower response rate unless staff members are given an incentive to play or have a special desire to change their travel modes. The segment of employees with the highest participation in the game is formed by people who are naturally concerned by environmental and/or health issues. A larger group of players can be attracted through other messages. The strongest messages identified so far are the promise of prizes to players and the social factor brought by teams (e.g. peer pressure). If these elements are incorporated into the campaign and highlighted in the invitation to employees, there is a higher chance of getting more employees to play. Also, it is important to stress that the game is for all groups, irrespective of their current mobility choices: even those that already travel sustainably and car users with perceived lack of alternatives are important in the game.
- **Communication channels used**: organisations have different methods of communicating with their employees and some might be more effective than others. It is important that the best channels are used and that reminders are made at the invitation process.
- **Influence of local ambassadors and/or involvement of administration**: the staff members who implement the game in the organisation are an important factor not only in the invitation phase but also in keeping the interest in the game over time. The potential involvement of the organisation's administration staff could also increase participation levels
- **Availability of alternative mobility options**: the more it is perceived by employees that they have alternative options to car use, the more they will be willing to play the game.

When asked to identify the aspects that contributed the most to their initial willingness to participate in the game, about 55% of the 251 respondents said that they wanted to improve the environment and/or quality of life. Contributing to the organisation's goals and improving health and fitness were also mentioned by over half of the respondents.

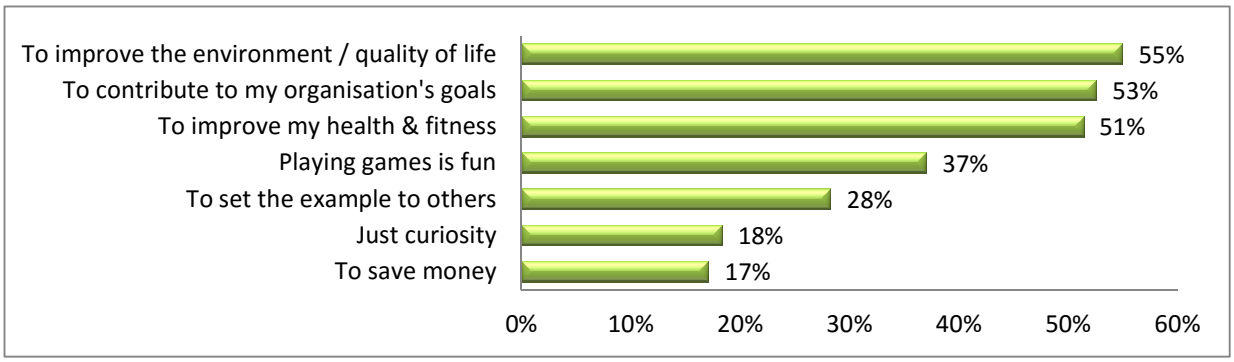


Figure 2: Aspects that contributed the most to the initial willingness to participate in the game

The Baseline questionnaire presents a number of characteristics of the companies involved (**Error! Reference source not found.**) which allow speculating on reasons for some differences in results, including the rate of participation. For example, in Nokia's case, part of the low rate of participation may be explained by the poor alternatives to car use in the office location.

Co-funded by the Intelligent Energy Europe Programme of the European Union

In the ANA game, where the SEGMENT Quiz[2] provides an idea of the type of persons who are interested in playing the game, 56% and 26% of the participants belong respectively to the 'Malcontented drivers' and 'Active Aspirers' segments (27 answers). These are the two segments that have indeed the highest potential for behaviour change in the short term, which suggests that the game is attracting people who are more likely to switch to sustainable modes. Minority segments revealed were the 'Practical travellers' (11%) and 'Image improvers' (7%). No participants belong to the remaining categories, including the 'Devoted drivers' segment or any of the carless segments. It is likely that this profile distribution is partly influenced by the profile of the ANA employee base, which is characterised by having a higher than average age group and highly educated staff.

Table 2: Example of baseline data of organisations from games analysed

	Joker (BE)	Jewel (BG)	CapGemini (NL)	ANA (PT)	NOKIA (PT)	Bistrita (RO)
Type of business / activity	Tourist Agency	Industry	ICT	Airport Management	Information Technologies	Local public administration
Quality of public transport	Reasonable	Poor	Poor	Good	Poor	Good
Quality of bicycle accesses	Reasonable	Very good	Reasonable	Poor	Poor	Poor
Congestion level	Moderate congestion	Low congestion	Moderate congestion	Moderate congestion	Moderate congestion	Low congestion
Benefits for public transport, cycling or carpooling?	100% of transit cost "Bike bonus" for 25% of employees Car: km or fuel costs for 25% of employees	Bicycle parking near the premises	100% of transit cost Cycling: Mobility budget for own use; shower facilities Car: Company car	No	Cycling: shower facilities Carpooling scheme	No
Average age of employees	37	38	38	45	35	45
Level of car use	85%	20%	80%	-	75%	45%

2.4 Satisfaction with From5To4

An average of 65% of players filled in at least 80% of the days, while 76% of players filled in more than 50% of trips (Figure 3). On average, the players filled in 4.4 days per week, with variations ranging from 1.8 (CapGemini) to 5.8 (Brasov).

[2] See the MOBI Evaluation Plan for details on the method and segments applied.

Co-funded by the Intelligent Energy Europe Programme of the European Union

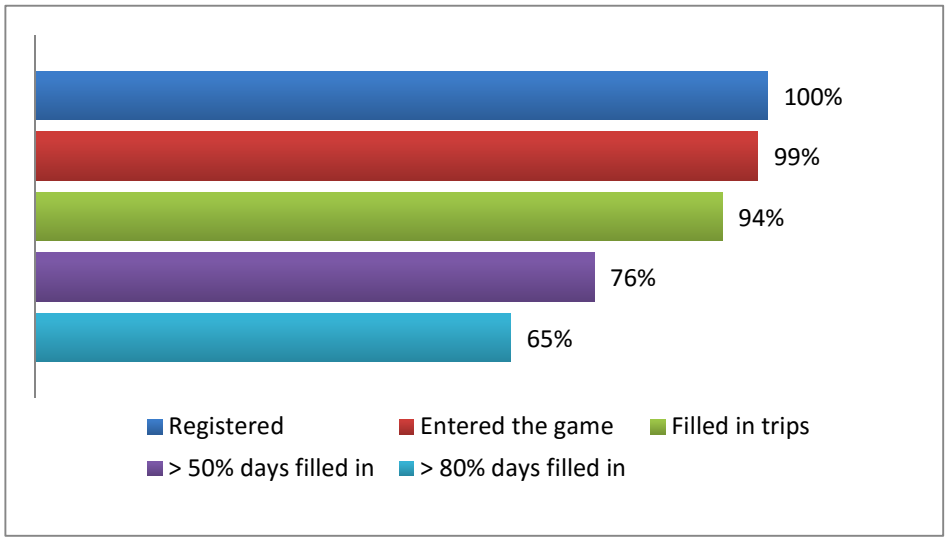


Figure 3: Level of participation of active players (per game)

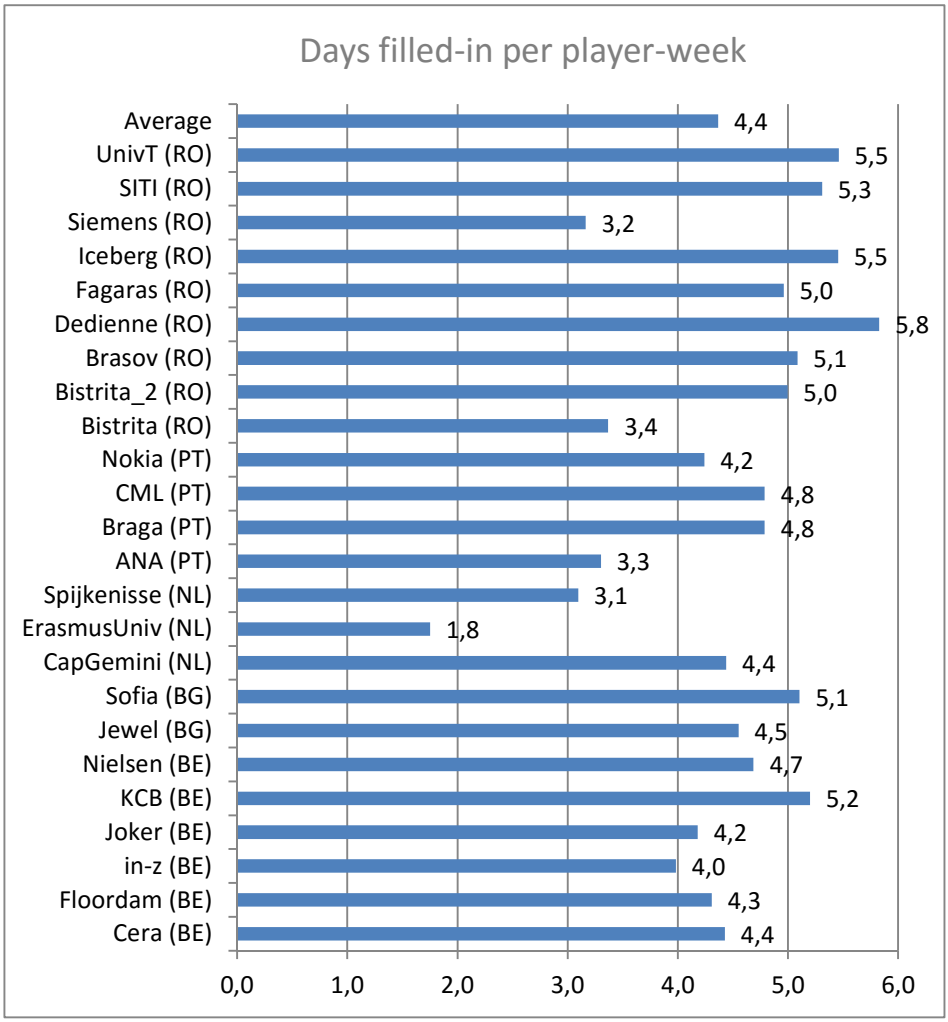


Figure 4: Days filled-in per player each week (average per game)

Co-funded by the Intelligent Energy Europe Programme of the European Union

The reasons identified in the previous section are also part of the explanation for **maintaining** the interest of employees throughout the game period. When asked which aspects contributed the most to maintaining their engagement in the game (Figure 5), the two most common responses were that they wanted to improve their own behaviour and the social interaction with their colleagues. This same opinion was expressed in several testimonies collected in the ANA game final event both by the ambassadors of the initiative and players. It seems that this type of dynamic worked particularly well in this game and might have been the explanation for ANA's high participation rate. About 91% of the final questionnaire respondents said **they would recommend the game to other colleagues or organisations**.

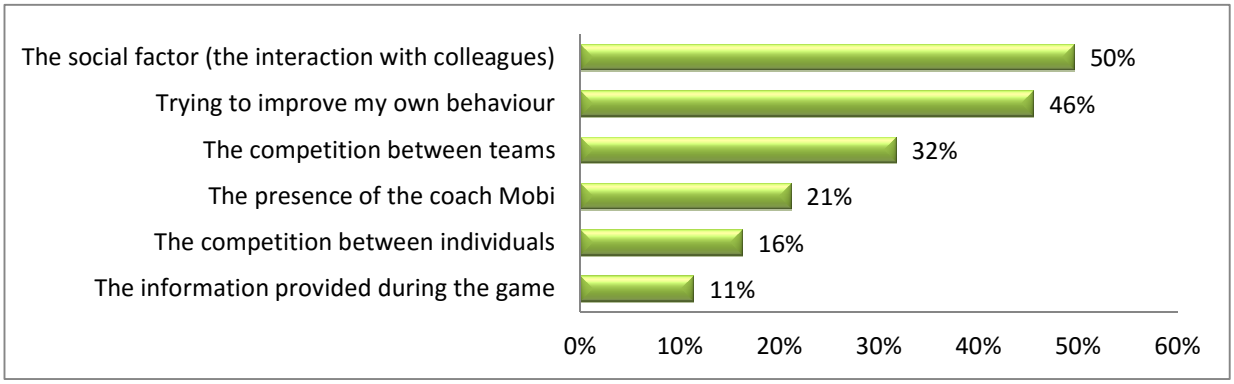


Figure 5: Aspects that kept players engaged throughout the game

Through this questionnaire and directly to the local staff, some players spontaneously highlighted what they didn't like about the game. The points are summarised below:

- The reward is the independent of the distance.
- The number of points attributed to each mode should be differentiated, in order to give a higher value to soft modes over public transport and over carpooling.
- There is no differentiation or bonus for using hybrids and electric vehicles.
- There is no reward for eco-driving.
- The tool presents some bugs that should be corrected.
- The option of avoiding rush hour [which was available only for certain games] is not combinable with other modes.
- The game assumes that both daily commuting trips are the same, while it might not always be the case.
- The progress bar – number featuring in the game is not well understood. Low progress numbers work discouragingly as the number is often misinterpreted as "I'm not doing well". It' also not clear how progress is calculated.
- The game should provide a way to communicate with the other teammates.
- The game presents no challenges to those who already travel by bike.
- Before the game starts there should be a small session to explain the game, introduce the teams, present the prizes and so on.

Co-funded by the Intelligent Energy Europe Programme of the European Union

- There should be more emphasis on cooperation rather than competition. Together you can achieve more than alone.
- It is hard to ensure that all participants are playing fairly.

Co-funded by the Intelligent Energy Europe Programme of the European Union

3 Behaviour change – acceptance, take up and satisfaction with alternative forms of mobility

The relevant assessment levels of behaviour change are:

- **Acceptance** of the mobility option offered
- **Take up** of mobility option offered
- **Satisfaction** with mobility option offered

These assessment levels are considered under the rationale that "behavioural change does not occur as a one-step process and can instead be viewed as a series of stages (or steps) which individuals progress through in order to reach the final stage, a new habitual behaviour"[3]. Therefore to get a full picture of the effects of the measure, an evaluation should consider these steps. The Max-Sumo tool is a four stage reference model that has been applied to this project:

• Stage 1: Pre-contemplative stage. Individuals in this stage are quite happy with the way they currently make their current trips (i.e. as car drivers) and at the moment have no wish, or desire to change to another mode.

• Stage 2: Contemplative stage. Individuals in this stage are not as content with their current travel behaviour (as pre-contemplators). They would like to change to an alternative mode of travel, but perhaps are unsure of which mode to switch to, or don't have enough confidence to do so at this stage.

• Stage 3: Preparation/action stage. Individuals in this stage have decided which mode they intend to switch to for some or all of their trips, and may have already tried this new mode for some of their trips.

• Stage 4: Maintenance stage. Individuals in this stage have successfully replaced some or all of their trips to the 'new' mode and this new behaviour (mode of travel) becomes the dominant mode they use for most of their trips (a new habit has been formed)

The final questionnaire to players includes questions on the evolution of the opinion of the players on each mode, their intention to use it in the future, and their actual behaviour more than one month after the end of the game.

Take up

The following figures show the baseline modal split and average modal split observed during each game. Major differences are observed in the baseline modal split, according to the local context, accessibilities and type of players. On average, the baseline car use is 43%. During the game, the observed car use is 26%. This represents a reduction of 17% in car use, which could be seen as a major success.

Such a result may not be representative for two reasons:

[3] *MaxSumo: Guidance on how to plan, monitor and evaluate mobility projects*, 2006. Project MAX - Successful Travel Awareness Campaigns and Mobility Management Strategies.

Co-funded by the Intelligent Energy Europe Programme of the European Union

- The sample of players that are active during the game would be biased towards non-car users. In other words, baseline car users tend to be less active throughout the game than players who demonstrate sustainable behaviour.
- The less active players would tend to be the ones that do not change behaviour, therefore the behaviour change record is not representative of the whole initial sample.

The first hypothesis was tested in two games (CapGemini and ANA) and it was observed in both cases that the participation of car users throughout the game was not significantly lower than the other players. As for the second hypothesis, there is no direct way to test it since it is not known from the game whether less active players have changed their behaviour, even though it is intuitive to think that they change behaviour less than the active players. The further analysis of quantitative results should take this possible caveat into account.

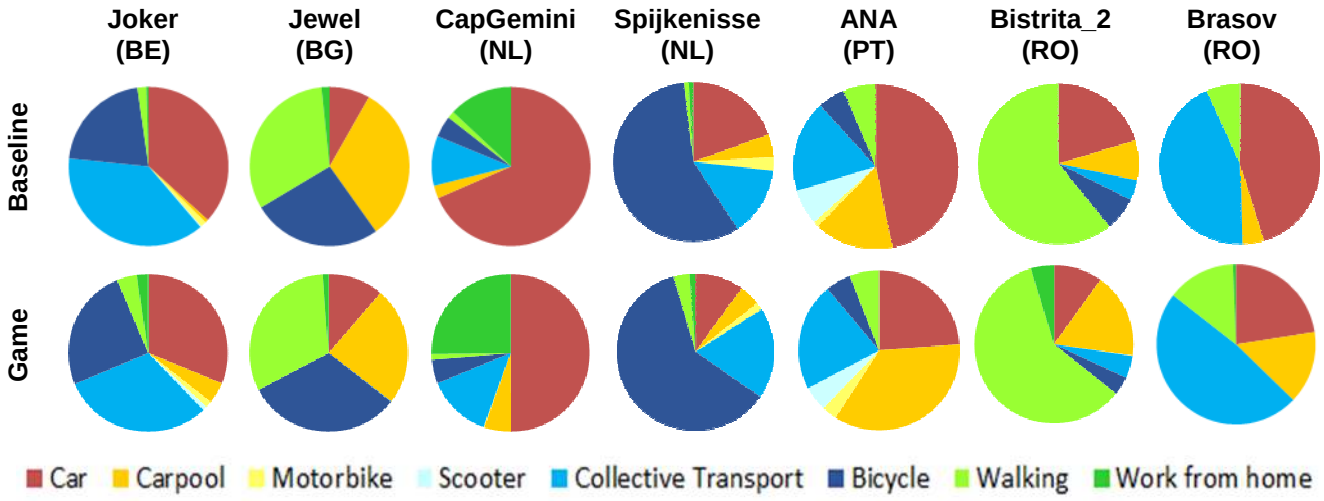
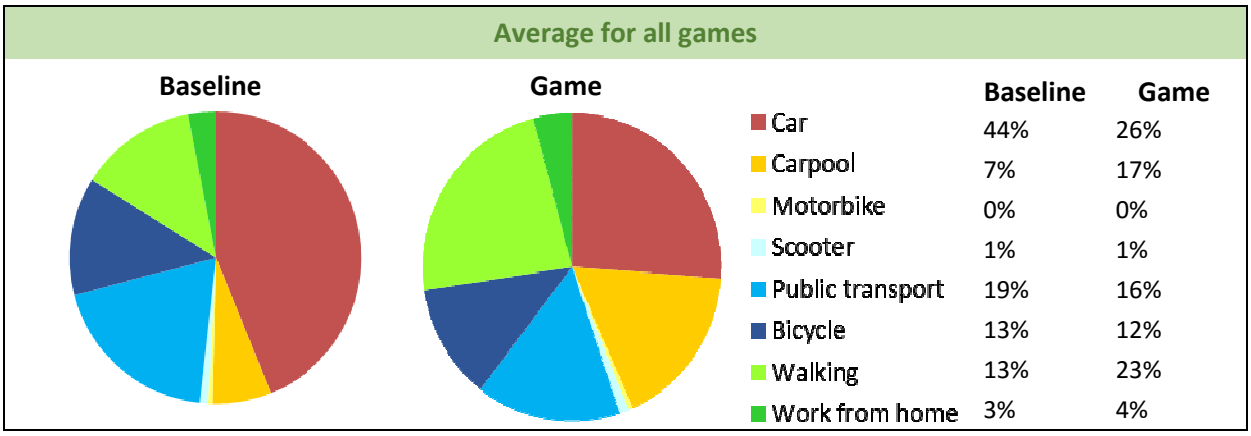


Figure 6: Modal split in some games (baseline and average during game)



	Baseline	Game
Car	44%	26%
Carpool	7%	17%
Motorbike	0%	0%
Scooter	1%	1%
Public transport	19%	16%
Bicycle	13%	12%
Walking	13%	23%
Work from home	3%	4%

Figure 7: Average modal split (baseline and average during game)

- The number of registered days per week (trips) using sustainable alternatives increased from 57% to 80%, **exceeding the From5To4 target of increase of 20%** (equivalent to one day of the week) (**Error! Reference source not found.**).

Co-funded by the Intelligent Energy Europe Programme of the European Union

- The increase was achieved in all sites, with the differential ranging from 0% (Jewel) to 45% (in-z).
- The most successful mode of transport in terms of relative variation was carpooling

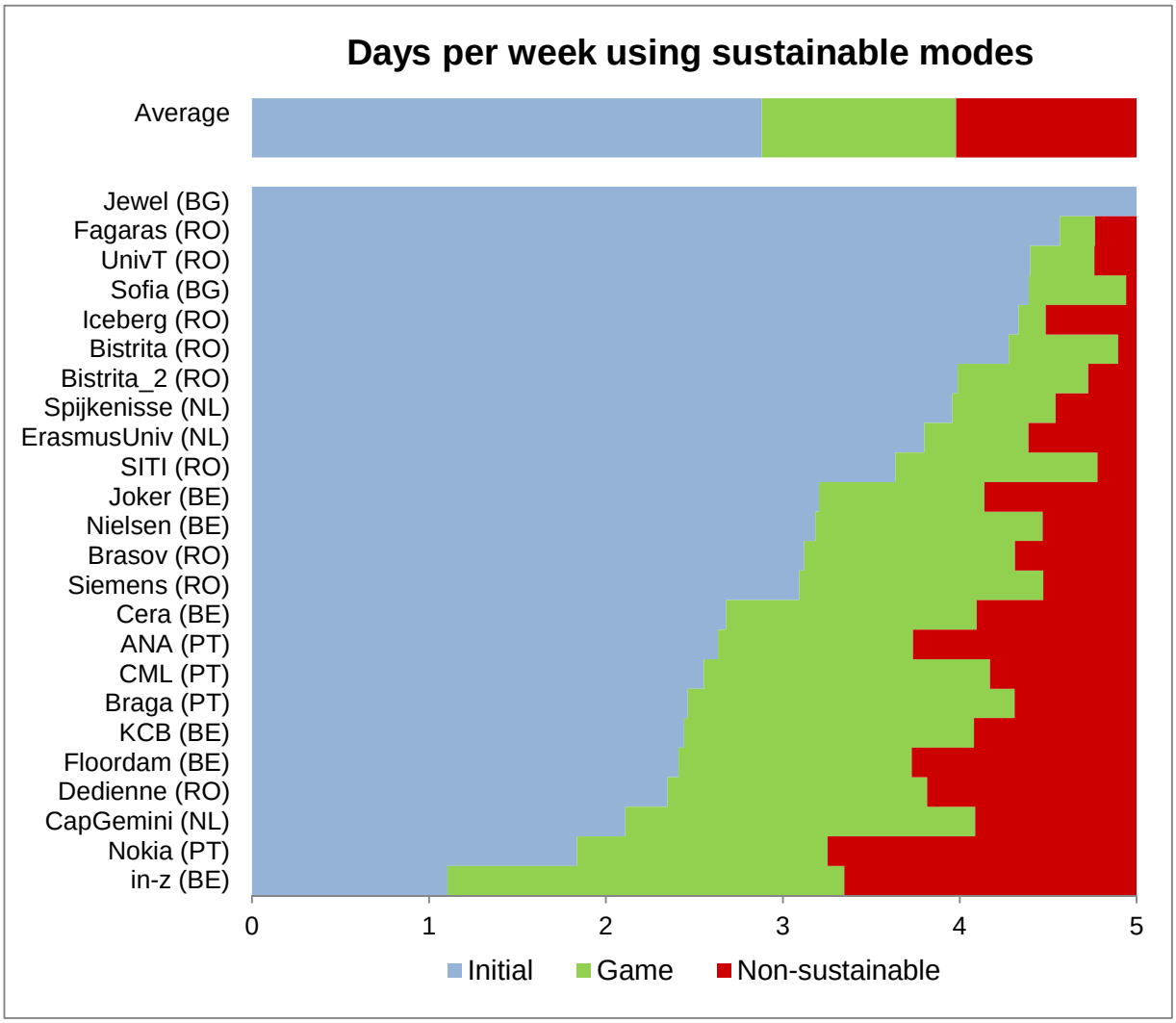


Figure 8: Days per week using sustainable modes

By analysing the modal share in terms of distances instead of number of trips (Figure 9) with their, it is possible to understand which modes of transport are used for longer distances per trip. For example, public transport (especially train), carpooling and car are typically used for longer distances.

Co-funded by the Intelligent Energy Europe Programme of the European Union

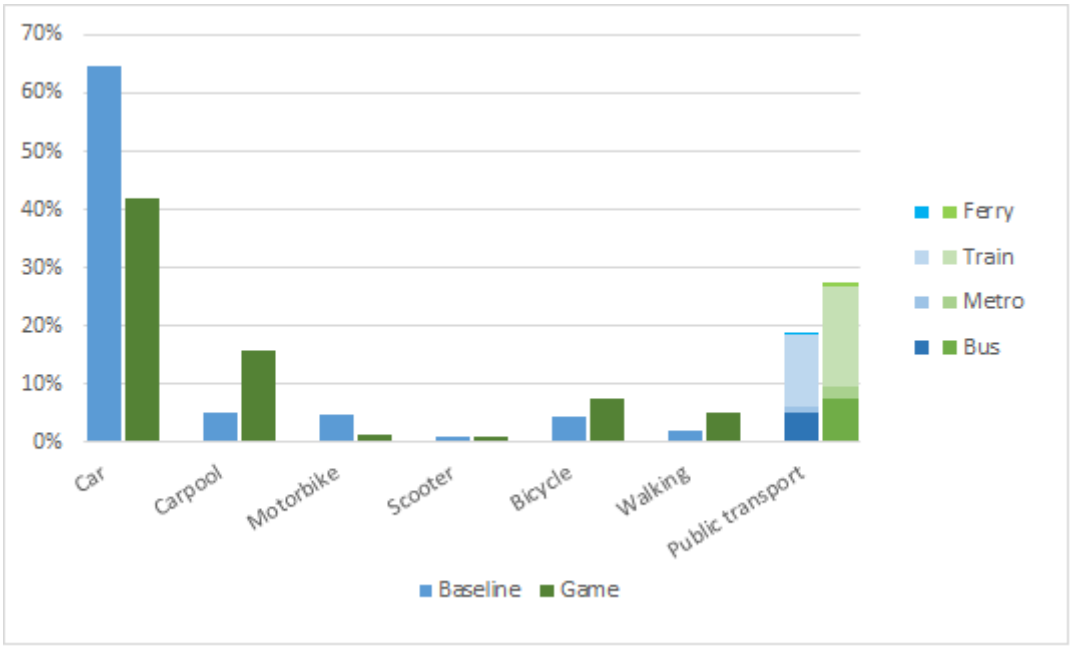


Figure 9: Modal share in terms of distances in each mode during baseline week and during the game

It is important to notice that while the modal share of cycling diminished in terms of number of trips, it actually increased in terms of distance. Conversely, the increase of the walking modal share was more impressive in terms of trips than in terms of distances. One possible explanation is that some players started to leave their cars farther away from their workplace, so that the last leg of their commuting trip was done on foot, therefore increasing significantly the number of walking trips but not so much the total distance walked. While this does not contribute significantly to the reduction of congestion, energy consumption and emissions, it does increase the physical activity of the players, which was also an important goal of the project.

Besides the specific features of the game (e.g. competition, information), two particularly relevant **aspects** were pointed out by the MOBI local staff as potentially **contributing to behaviour change**:

- The local **availability of appropriate infrastructure** to support sustainable modes of transportation. The quality of alternatives is crucial for the willingness of employees to change behaviour. In some countries the criterion was applied that participating companies should have at least two reasonable alternatives to individual car use.
- The **flexibility of the game** that gives each player an opportunity to change their travel behaviour. For example, at Floordam (Belgium) some car-dependents chose to park their cars 2km away from their place of work and to walk the remaining distance. This way they could also earn points per trip.

Generally, behaviour change by employees who participate in the game is successful. **Most players who participate in the game do change their behaviour**, increasing the number of times they use sustainable alternatives to car. On the other hand, potential players who believe

Co-funded by the Intelligent Energy Europe Programme of the European Union

from the start that they won't be able to change their behaviour tend not to participate in the game even if they have an initial interest in it. To avoid this, it is necessary to communicate that the game welcomes all players and that any changes in behaviour, even very minor changes, are enough to achieve the goals. Some players in this situation might end up making positive improvements despite their resistance or belief that they are unable to change, due to the lack information of the real advantages of some alternative mobility options or because they are too attached to their daily habits and believe they can't be changed. This has been reported in ANA, where some employees who initially were not interested in playing because they believed they would not be able to change, after insistence from the local MOBI team they did participate in the game and used alternative modes (e.g. carpooling, cycling).

Acceptance and satisfaction

The following list shows how users were encouraged to switch to sustainable modes during the game (and after):

- Players trying sustainable options
- Peer influence – the social factor among players will help to encourage a change during the campaign.
- From the Mobi hints – the hints regularly given by Mobi pass positive/negative messages on sustainable modes/car.

To the question "How has your OPINION on the quality of each accessibility option evolved between the time before playing the game and now?", the respondents of the final questionnaire returned the following answers:

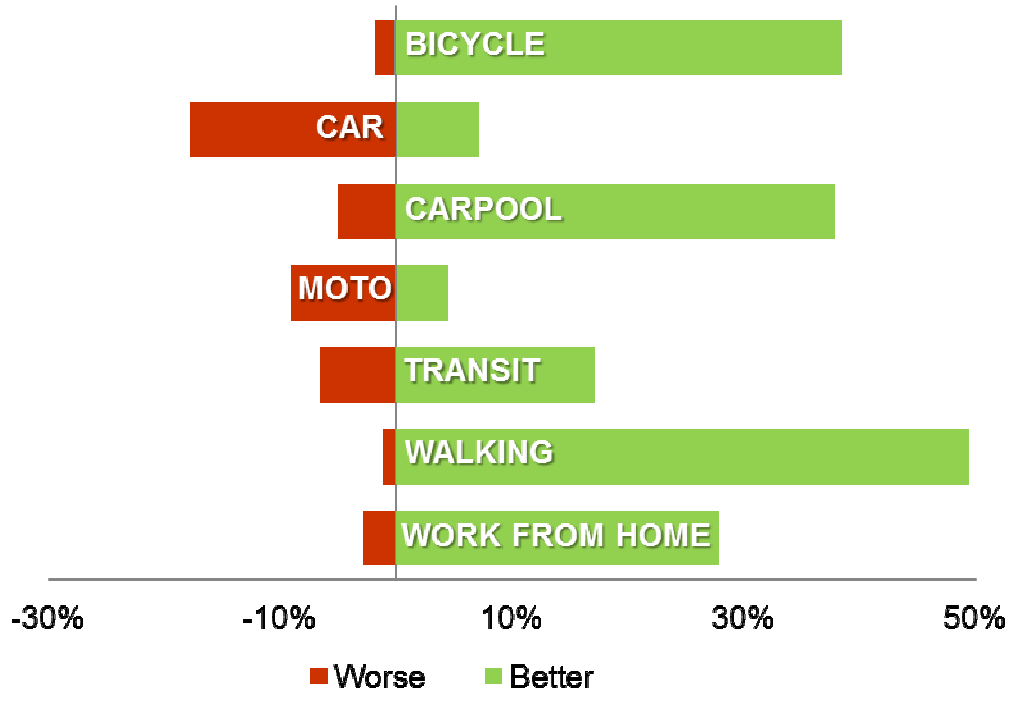


Figure 10: Evolution of the opinion regarding each mode

Co-funded by the Intelligent Energy Europe Programme of the European Union

The opinion clearly evolved favourably in all alternative modes to individual car use except for motorbike/scooter. This exception might be an account of the influence of the weekly Mobi hints, which did not address two-wheeled motorised vehicles either positively or negatively. In most cases the percentage of individuals who stated that their opinions on each mode improved is higher than the percentage of those who tried such modes, which means that the opinion improved among players who did not necessarily try those mobility options. While 17% of respondents improved their opinion on public transport, about 7% of the respondents said their opinion on this mode had got worse than before the game.

The fact the improved opinions were higher than the actual behaviour change could be an indicator that even though behaviour change didn't occur in the short term, it has a better chance to take place in the future. This is related to the following question which stated: "How has the LIKELINESS evolved that you will use each accessibility option in the future?" (Figure 11).

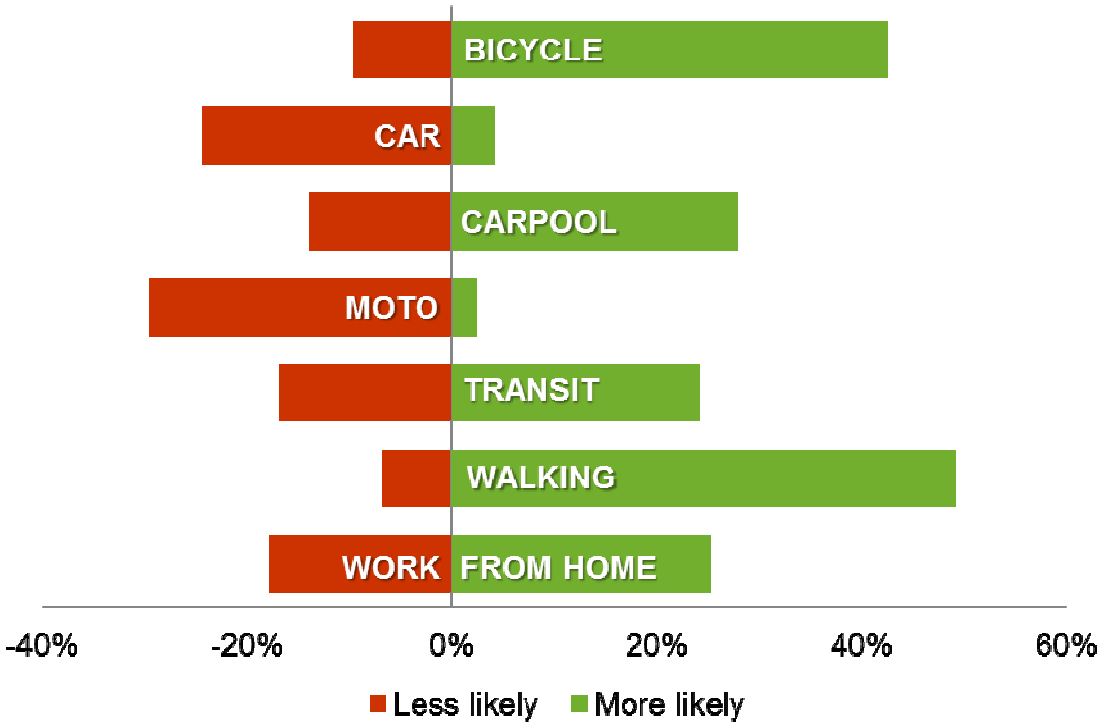


Figure 11: Evolution of the likeliness of using each mode in the future

The satisfaction with the mobility options tried may also be assessed by the longer term behaviour (Section 4), where behavioural change seems to have been persistent after the game ended.

Co-funded by the Intelligent Energy Europe Programme of the European Union

4 Overall effects

4.1 Long-term attitudes and behaviour

The final questionnaire is completed at least one month after the completion of the game in order to capture the influence of the game on the players' attitudes and behaviour when they are outside the influence of the game.

The longer term attitudes may be assessed by the evolution of opinion on sustainable modes of transport, which as we've seen above has clearly improved for all sustainable modes. On average, perceptions of each mode described as sustainable to players (cycling, carpooling, collective transport and walking), were much improved after the game. Additionally, perceptions in relation to car use for 18% of users decreased (Figure 10), while 24% stated that the likeliness that they would use the car in the future decreased (Figure 11).

As for behaviour change, the final questionnaire showed the following results:

- **57%** of respondents declared that after the game had ended, in relation to their original behaviour, they had **increased the utilisation of some form of sustainable mobility**;
- **39%** of total respondents stated that they had **decreased their car use**.

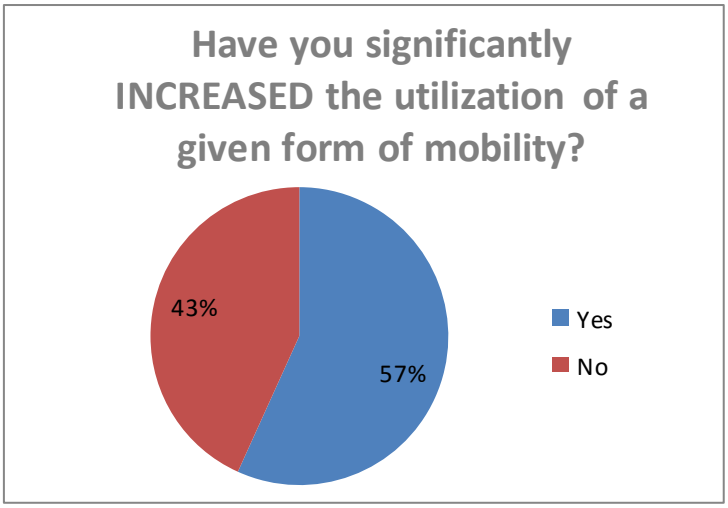


Figure 12 – Players changing behaviour in long-term

In the longer term, it can be expected that the behaviour change promoted by From5To4 on employees who participated in the game will partly and slowly extend to peers within and outside the organisation. It is impossible to quantitatively evaluate how much and when such change is occurring, but it is plausible to expect that the effects of such peer influence will be relevant. In this way, From5To4 may be seen as a trigger to long-term sustainable mobility in organisations.

Co-funded by the Intelligent Energy Europe Programme of the European Union

4.2 System impacts (emissions and health)

From the results of the game in terms of modal split and change in kilometres in each mode of transport, it is possible to estimate the changes in terms of energy and emissions, as well as health. The final feedback report will provide a more complete assessment, while this report concentrates on CO_2 savings and calorie consumption (as a proxy for health improvements).

- On average, 200 g of CO_2 have been saved per trip[4]
- On average, 51 kg of CO_2 have been saved per week
- The MOBI games have so far saved **14.7 tons of CO_2 emissions**
- The MOBI games have so far saved **5.5 toe**[5]
- The average CO_2 and energy savings have been **27%**

- On average the weekly additional calories burned per game is of 1916 calories[6];
- This represents an increase in calories burned of 24% from walking and cycling.

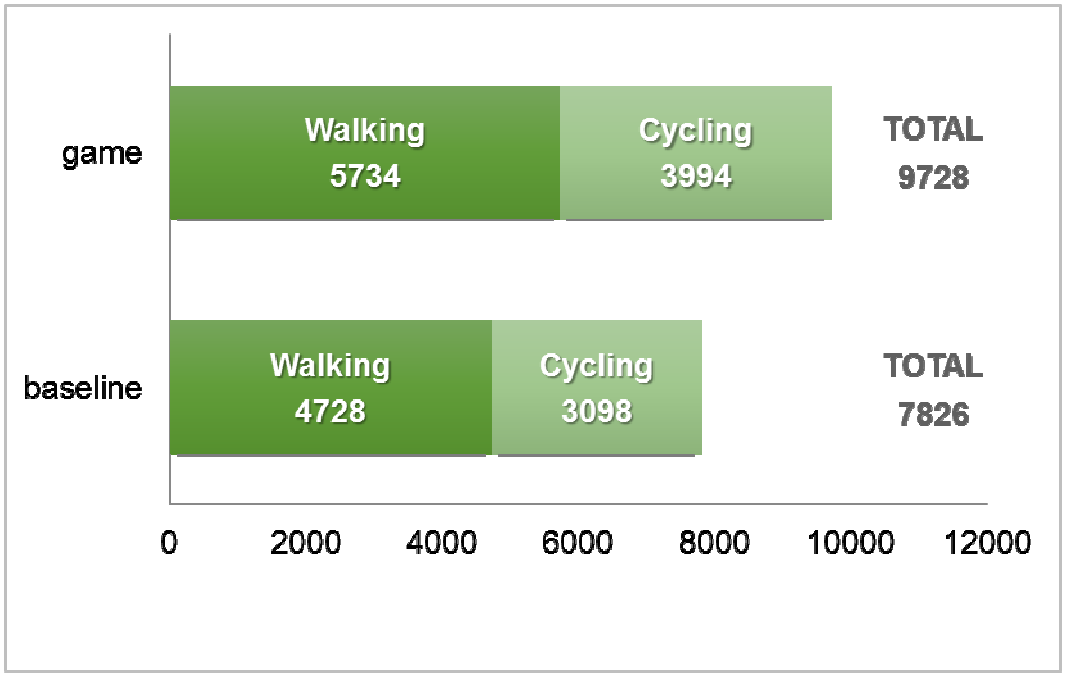


Figure 13 – Calories burned per week (average per game)

[4] The following specific emission factors (g/km) were considered: car – 172; carpooling – 86; motorcycle – 74; scooter – 37.

[5] The following consumptions (TOE/km) were considered: car – 6.4×10^{-5}; carpooling – 3.2×10^{-5}; motorcycle – 2.7×10^{-5}; scooter – 1.4×10^{-5}.

[6] The following calorie burning per kilometer (calorie/km) were considered: cycling - 27.39; walking - 50.6.

Co-funded by the Intelligent Energy Europe Programme of the European Union

5 Feedback and recommendations

The experience with the game shows that From5To4 is effective in keeping the players engaged. Over 65% of the players fill in more than 80% of the days, with each player filling in on average 4.4 days per week. Over 91% of the players stated they would recommend the game to other colleagues or organisations. For games of long duration, some extra actions may be needed in order to rekindle the interest of the players, such as events or small regular prizes. The results also show that From5To4 is effective in changing the players' behaviour, both during game and long term. On average, active players increase their use of sustainable modes in 22% of their work days over the game period. The CO_2 emissions and energy consumption decrease 27% and the calories burnt increase 24%. Most players who engage in the game and become active take behaviour change seriously. Participants reported continued use of sustainable modes after the end of the game period. Even if they do not use them, the game also generally improves their image on the quality of alternative modes of transport and decreases their image of private cars.

Given this potential, the most difficult challenge in the MOBI project has been to convince organisations to adopt the game, and its employees to play it. Many organisations have shown interest in the game, but for various reasons, including the fact that there was a limited experience in implementing the From5To4 game, a smaller number of organisations took the step of adopting the game. With the success of the games in organisations where they have been played and the best practice cases, this barrier has been slightly overcome. It is also apparent that companies (and divisions within companies) have specific reasons to play the game and that a key success factor is to identify those reasons for each case in order to properly promote the right messages. This can be done before approaching the organisations through desktop research or knowledge of the organisations priorities, or during the Baseline meeting (for example in a presentation meeting). In the latter case, it is crucial that the MOBI staff is able to 'sell' the game through knowledge of how the campaign can be modified to meet their needs. The deliverable *MOBI Context and Market Potential* deepens the analysis of implementation scenarios and provides detailed guidance on more effectively approaching organizations considering their specific contexts.

A second challenge, within each organisation, is to convince its employees to play the game. This has been achieved with varying degrees of success in different organisations. A crucial element is the way employees are asked (or suggested) to play the game. If the organisation's communication states it is important for the organisation that staff plays, a better uptake will occur. Communication to staff should not only focus on "green" or "health" causes but also to direct individual and team benefits. Besides the involvement of the administration of the company, one of the main decisive factors is the enthusiasm and charisma of the staff responsible for the initiative.

Finally, the last challenge relates to the tool itself. Software of this kind is never complete as there are always small bugs to be corrected and personalized requests to be fulfilled (a company might want to change the way the CO_2 emissions are calculated, so that it fits their methodology; they may want a Mobi avatar with the company's logo; they may want to push a specific type of transport, etc.). The tool must be able to respond quickly to these requests, otherwise the companies may lose interest.

Co-funded by the Intelligent Energy Europe Programme of the European Union