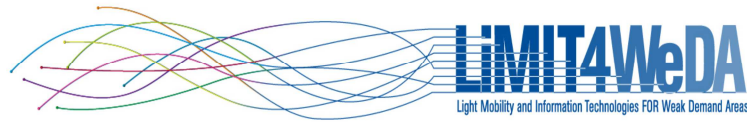


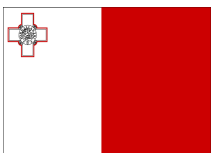


Projet cofinancé par le Fonds Européen de Développement Régional (FEDER)

Project cofinanced by the European Regional Development Fund (ERDF)



- Project Acronym:** LiMIT4WeDA
- Project Title:** Light Mobility and Information Technologies for Weak Demand Areas
- Lead Partner:** Lazio Region - Regional Department for Transports
- Component:** Definition of an evaluation methodology
- Phase:** Design of pilots and ex-ante evaluation
- Responsible Partner:** Cyprus Center for European and International Affairs (CCEIA)
- Partner:** Malta Intelligent Energy Management Agency



MED Operational Programme – Cohesion Policy 2007-2013
Europe in the Mediterranean

This project is part-financed by the European Union
European Regional Development Fund (ERDF)
Co-financing rate: 85% EU Funds; 15% National Funds



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Executive Summary

Problems associated with transport in the Maltese islands have always been on the increase. Even though Malta is a very small island it has a very high density of private cars. The direct consequences of this are extreme traffic congestion and high carbon emissions. The public transport system is relatively inefficient, especially in the more remote areas, and this leads to the widespread use of privately owned vehicles. Local public transport should be made more efficient and available in more places.

In Malta, buses generally operate between the village or town centres and the capital city, Valletta. The bus terminus is normally located in the central square of the village or town, and routes usually lead directly to Valletta without doing the round of the outskirts, meaning that many passengers have to walk substantial distances to get to the centre or to the closest bus stop. This is quite inconvenient especially in the morning when people are rushing to work or school, and particularly in bad weather. There is a need to find solutions which can make public transport more flexible by introducing new ideas and applications using technologies that will help to achieve a system which is simultaneously convenient and cheap.

This goal can be attained with the support of incentive schemes from transport companies in order to increase demand. Moreover, specific schemes can target, and be jointly run, by businesses with a view to catalysing the take-up of public transport by employees. In a similar fashion to 'jeans day', which was last held on 28th April 2011, private businesses can earn green certification by actively promoting car free days among their workforce. Moreover, the Internet can offer a simple yet effective way to set up car sharing portals between employees working at different premises within walking distance to each other.

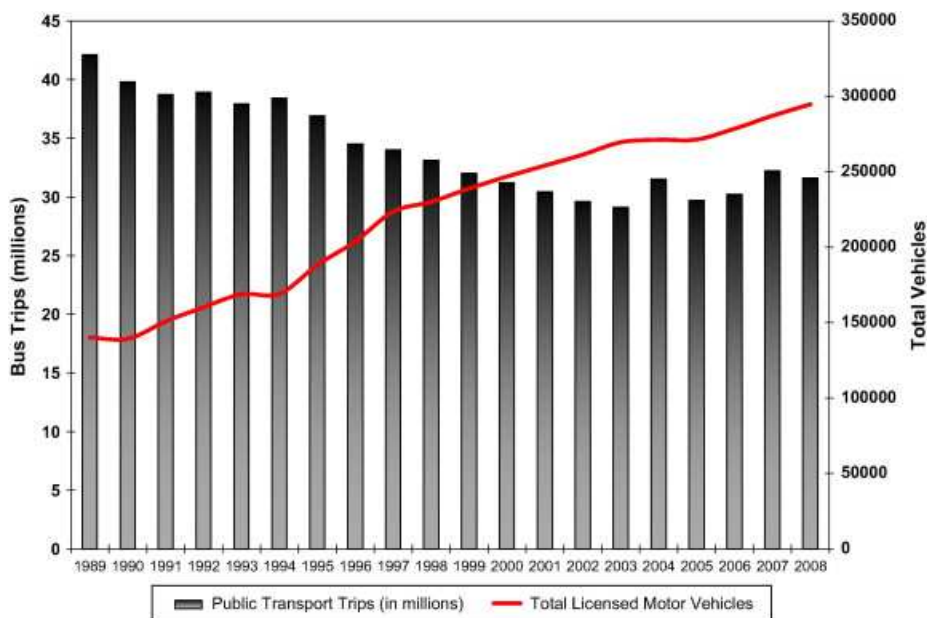
1 LiMIT4WeDA

LiMIT4WeDA is an EU funded project which is approved under the MED Operational Programme – Cohesion Policy 2007-2013 – ‘Europe in the Mediterranean’. The acronym ‘LiMIT4WeDA’ stands for ‘Light Mobility and Info-Mobility for Weak Demand Areas of transport’, and the project aims at improving mobility in those locations which are affected by weak demand. These are characterised by less-than-average demand for transport to or from a particular destination.

It is a well known fact that car owners in Malta make an exorbitant number of journeys without any passengers, meaning that the carbon footprint of the car for one such journey is owned by a single person. Conversely the emissions per capita are reduced proportionately to the number of passengers travelling in the same vehicle.

As evident in figure 1, the use of public transport declined periodically in inverse proportion to the total licensed motor vehicles. Figure 1 evidently shows how the use of private transport increased whereas that for public transport declined.

Figure 1 Public transport patronage and private vehicle ownership (1989–2008)



Sources: [National Statistics Office, 2006], [National Statistics Office, 2009] and [MaltaTransport Authority, 2006]

1.1 Providing Alternative Private Transport for the Cottonera area

The Grand Harbour area of Malta is the focal point of civil and industrial activities in Malta, with the associated pressures on the transport infrastructure and networks. The project aims to propose ways to alleviate the problems of congestion and carbon emissions by encouraging and incentivising boat transport within the harbour area, thereby improving accessibility to the three cities of Birgu, Bormla and Isla and the surrounding areas, collectively known as 'Cottonera'. Introducing clean electric motors in lieu of the current internal combustion outboards will enhance the boats' environment performance by cutting down on harmful emissions and the overall contribution to greenhouse gas emissions, while also offering new economic development opportunities that combine a traditional means of transport with modern ICT tools.

The pilot project should facilitate the provision of a viable, sea transport service between Cottonera and the surrounding areas to Valletta. For commuters, the transportation mode needs to be fast, clean and efficient. It has been estimated that the crossing from Dockyard Creek (Isla or Birgu) to Valletta takes only about 6 minutes, whereas buses or private cars take considerably longer. Sea transport can therefore offer short linear crossings across the harbour or traffic-free trips to other destinations around the coast. This can provide commuters to and from the Cottonera with a viable alternative. Such a service should prove particularly attractive, and take-up encouraging, as Cottonera residents have recently been complaining of the inconvenience of the public bus transport due to the low frequency of the local service, the long routes, and road congestion. On the other hand, the installation of the public lift taking passengers from Lascaris Wharf to the Upper Barrakka Gardens (at the entrance to Valletta), which is expected to be completed in 2012, will make transport by boat quite attractive for residents of Cottonera.

1.1.1 The 'Dghajsa' in Relation to Public Transport

Given that the time for the entire trip by boat and lift is shorter than that taken by public buses, taxis or private means of land transport, it will be convenient to

commute to destinations around the Grand Harbour by the traditional harbour boat, known as the *dgħajsa*, as long as the rates for tickets or period passes remain competitive. The proposed pilot project will therefore not only reduce air pollution by cutting down traffic from the congested roads, but it aims at introducing a much cleaner transport service by converting the use of motors on the boats from mineral fuel to electric. In addition, it will revive and age-old tradition of harbour boat industry and associated trades, such as boat building and maintenance, which risk disappearing for ever with each successive generation. It is proposed that the infrastructure needed for such a conversion be tested and tried out through the Limit4WeDA project.

Apart from the infrastructure, it is essential that the service proves to be reliable and efficient. For this to happen, MIEMA is proposing to use IT tools, such as computerised electronic boards, GPS systems, web portals and online booking sites, etc. to render the service efficient and well-organised, as well as well-publicised and marketed. In this way, the operators will be in a position to increase the popularity of the service and to keep the ticket prices low and competitive. MIEMA's challenge is therefore to propose tools to organise the service in a rational and professional manner, in order to ensure quality, consistency and reliability.

1.2 The Influx of Tourists in Grand Harbour

In addition to the convenience for commuting residents, the service also offers tourists an attractive way of travelling around the Grand Harbour, and one with a high perceived added value. Care should therefore be taken to promote the attractiveness of the trip itself, where one can admire the bastions and coastal heritage sites. Being a traditional form of transport, albeit nearly completely neglected, the service would also offer the opportunity to valorise forgotten trades, like boat-building and local customs associated to authentic traditions and the way of life of these maritime cities.

1.2.1 The 'Dgħajsa tal-Pass'

The highlight on the *dgħajsa* service was planned after group discussion with all stakeholders that managed to bring to the surface the prospects and advantages of adapting such a type of transport for the Grand Harbour. The Malta Tourism Authority (MTA) had published a brochure on "The Grand Harbour Water Taxi" (that is, the '*dgħajsa tal-pass*') describing the story-line of the *dgħajsa* taxi service:

"The 'dgħajsa' has served as a water-taxi for decades. It has also represented the main connection between Valletta and the Three Cities of Vittoriosa, Senglea and Cospicua. This mode of transport used to be utilised by everybody until the coal fuelled boat, and then the bus, made it easier to reach Cottonera."

This change coincided with the greatest and most significant years of the presence of the Royal Navy in the Maltese Islands, when Grand Harbour and Marsamxett were swarmed with warships. This era was the hey-day of the Barklor or 'dgħajsa-man' and his *dgħajsa*.

After the British forces left the islands for good in 1979, it was hoped that the role of the *dgħajsa* would change so as to attract the attention of the discerning tourist, but this dream was never realised. Nowadays, only a small number of barklori are still manning their oars out of nostalgia of the good old days, when the *dgħajsa* was prominent in every part of Grand Harbour.

Figure 2 The Grand Harbour Water Taxi



Source: Malta Tourism Authority

1.3 ICT-Enabled Services

The proposed service will also bring a wider flow of tourists to Cottonera, generating economic development in this region. The adoption of a good marketing strategy to promote it is therefore imperative, and the use of ICT tools for this purpose would be very useful.

The Times of Malta on Wednesday 13th of July, 2011 described how the Maltese boatmen in Senglea had launched a semi-regular harbour service using their traditional 'dghajjes tal-pass' after people complained that the bus service is taking far too long to reach Valletta. Ironically the boat owners were among the first to suffer from competition when the buses were introduced a century ago.

In the manner being proposed, regular commuters will be able to travel across Grand Harbour using an electrical powered boat carrying a negative carbon offset. While doing so the commuters are relieved from the stress correlated with traffic congestion and pollution to which road transport is typically prone. Transport carries a double

carbon offset meaning that the effective carbon offset of a single unit of greenhouse gas is equivalent to double that amount.

1.4 Accessibility

There needs to be good coordination between the boat transit service and land transport, possibly utilising an electric vehicle passing through the urban exchange node at the place known *It-Toqba* in Birgu.

Secondly, the *dgħajsa* terminal and surrounding area need to be equipped with better facilities for access to and from the boats. Barriers to mobility need to be eliminated and the service made more user-friendly, thereby improving accessibility for all, including older citizens, families with children using pushchairs, etc. The possibility of introducing mechanical means to transfer mobility-challenged persons to and from the boat can also be considered.

1.4.1 Carbon Footprint

An environmental upgrading of the site of *It-Toqba* is also being considered. The pilot action would include improvements and embellishments through the installation of street furniture, signage, lighting and other amenities, to make the area safer, aesthetically more pleasing and user-friendly.

1.4.2 Economic Development

Other measures will encourage networking among local enterprises in order to develop synergies. The *dgħajsa* service will provide the drive for the development of other economic activities, integrating the coastal areas to the region's productive sites. The project will help build a network system to develop a suitable strategy for the area, based on the maritime activities and cultural heritage of the region. This would entice tourists to spend more time in Cottonera, generating higher economic activities for more businesses in Bormla, Isla and Birgu.

1.4.3 Competitiveness and Innovation

The proposed strategy would lead to synergies that enhance the competitiveness of the national tourism product and contribute to the socio-economic progress of the region. It will encourage the setting up of new enterprises or the development of already existing ones, motivating local improvement. New marketing opportunities would be created by the expected opening of more recreational and catering establishments, such as cafés, wine-bars, restaurants serving typical local food, clubs and commercial outlets. The development would also revive the traditional trades associated with boat-building and other traditional Maltese skills, thus exploiting the cultural footprint of the region.

The proposed network of enterprises would therefore need to offer attractions to keep tourists visiting by boat. These would need to promote each other and make visitors aware of the wealth of tangible and intangible cultural heritage of the region. The boat trip could therefore serve to provide information about the Cottonera attractions – the bastions and fortifications, the local museums, historical sites, etc. The influx of tourists would create a market to allow other economic operators of the region to flourish.

Figure 3 Typical Maltese Dgħajsa sailing in Grand Harbour



Source: *Times of Malta*

A web portal needs to be developed for this project in order to exploit this new mode of transport. The web portal can provide information about the different options available to commuters travelling to Valletta from Cottonera and the surrounding districts. The transportation mode is fast, clean and efficient. It is estimated that the crossing from Dockyard Creek (Senglea or Vittoriosa) to Valletta takes only about 6 minutes.

2 Discussions with Stakeholders

Carpooling represents an alternative to single occupancy vehicle use for commuting, and it might be worth considering the implementation of similar tools that have been successfully adopted abroad.

Figure 4 Regional Consultation in September 2011



As part of this project, the Malta Intelligent Energy Management Agency held the second International Event about Innovative Transport Solutions on Friday 30th March 2012. The event was designed such as to involve the public and the stakeholders in two parallel sessions. One of them was animated by Eng. Albert Falzon (MIEMA) and it interfaced public transport with individual mobility. The other

parallel session was animated by Christopher Maier (AEM) and it focused on the interfacing of tourist demand with permanent residents.

Figure 5 Parallel of the International Transport Event, Malta, March 2012



During the parallel sessions the attendees could discuss what they thought to be the most prominent obstacles in reducing the popularity of the private cars as in the case of the Car-pooling scheme which is being promoted amongst the employees at Gasan Mamo, a Maltese insurance company.

Finally, as the parallel sessions drew to an end, it was clear that those who attended the meeting were up for more since they asked MIEMA's staff for more information about the car sharing network and expressed their interest in attending future activities.

Figure 6 Albert Falzon during a Radio Session about LiMIT4WeDA



In the presence of radio presenters MIEMA representatives have discussed the various energy related issues on air. In spite of the fact that the Maltese radio stations broadcast across the archipelago, some radio stations may still attract a particular kind of listener. Listeners may be classified by age, locality, religious belief and sub-culture. The variety instilled the need of specific media which could be utilized accordingly to fulfil their requests. This required the scrutiny of various points and details affecting the related domestic applications as highlighted by the participants on air.

During each session there were various listeners who participated by contacting us by phone. On air we described the various issues which affected particular regions and families. Some of the participants confirmed the usefulness of the tips mentioned. Information days and seminars need to be tackled specifically in relation to the target audience. Information must adapt to their current situations and frame of thought. On a domestic basis those with a relatively lower income would be keen to improve their households.

3 Aims

The LiMIT4WeDA project will effectively meet the main objective of offering an efficient, quick transport link between weak demand areas and Malta's Capital, which also acts as a hub for public transport. In addition, it will improve transit reliability through facilities to enable trips to be pre-booked online using a purposely developed web portal, while also reducing pollution, noise, traffic congestion and parking pressures. Subsequently it is proposed to increase the catchment area by having a nearby car park offering free parking bays can be used by cars that carry at least one passenger.

By so doing, the project offers an alternative, greener route for a wide catchment area in the southern part of the island, providing the possibility of avoiding the last 4 or 5km of the usual trip to Valletta. This stretch of road is most congested during peak hours, and consequently it would result in a lower overall transit time, less fuel consumption, and less driving related stress. The proposed pilot also offers improved accessibility to the Cottonera area to tourists visiting Valletta, and to passengers aboard Cruise Liners berthing just beneath Valletta, by replacing the approximately 6km car trip with a more pleasant traditional boat ride across the harbour.

Taking an average car load factor of 1.255 and average car emission factor of 208.64gCO₂/km as calculated using the model presented by EMEP/EEA and applied to Malta's car fleet - at least 5KgCO₂ can potentially be saved per one way trip (6 passengers). Running a service every 5 minutes during the peak rush hour would save at least 15.6tCO₂/year once the boats are converted to run on battery.

4 Information Technology

The use of IT-enabled measures to improve and promote the service is fundamental to the functionality of the system. Web-based portals, incorporating social media pages within a dedicated website, would support the service and render it more efficient. A GPS-enabled infrastructure would allow the geographical mapping of the boats to assist and improve the service. A second web-portal will be designed to promote accessibility to Cottonera and a new transport option combining land and sea transport.

4.1 Booking Features

The Event Registration extension needs to be developed to allow for the creation of events (both free and paid), to permit registrants to register for these events (Individual or Group registration), and to process payment via online payment gateways such as Paypal, Authorize.net, Eway, WorldPay and Offline Payment gateway.

This kind of software chosen will be meant to offer a user-friendly environment for facility scheduling, function coordination and event management. Its features are focused on preparing all facets of a facility, providing the user with the ability to efficiently organize information and run custom reports. The system should also be available for smart phones. In this way the functionality of the website can be utilised from anywhere, anytime. The applications should work well on most smart phones and tablets.

4.2 Other Features

The portal will have the following features:

- *Nested categories*: Online trip booking allows users to organize events across infinite categories and subcategories.

- *Trip management:* Online trip booking allows for the creation and management of trips from the back-end of the site. It will allow users to create both free trip and paid trips. Users will be able to browse for trips and register themselves for this trip from the front end. One can also create daily, weekly and monthly recurring trips.
- *Front-end trips submission:* Online trip booking allows users with the right permissions to submit trips from front-end of the site.
- *Free and Paid trip support:* One can create both free and paid trips and, in the case of the latter, registrants can pay via Online Payment gateway such as Paypal.
- *Collect registrants information:* Online trip booking allows administrators to collect information about registrants, including individual and group registration, when they register for trips. Basic information such as first name, last name, etc. and any additional information can be collected using custom fields. Administrators can change settings to show / hide, and can even set any fields on the registration form to required / not required.
- *Group and Individual Registration support:* Users can register for a trip either individually or as a group. For group registration, users will be able to enter the necessary information for all members of the group. Furthermore, with group rate settings for each trip, administrators will be able to give discounts for group registrations.
- *Multilingual support:* Online trip booking allows administrators to create trips, categories, locations, custom fields etc. in different languages.
- *Shopping Cart option:* This feature allows registrants to choose to register for several trips within one checkout. It works much like a shopping cart system.
- *Deposit payment:* Trip Booking allows administrators to specify and set up deposit payments for each trip. This means that if the system is set up for a deposit amount for an trip of, for example, 50%, users will pay 50% of the total

registration fee when they register for a trip and the remaining when they come to attend the trip.

- *Multi-payment gateways support:* Online trip booking should have Paypal, Authorize.net, Eway, Worldpay and Offline payment plugins available by default.
- *Coupon code support:* Administrators can create coupon codes from the back-end of the extension and send these coupon codes to customers so that they get a discount while registering for trips. Coupon code can give discounts by amount or by percent of total registration cost, and can be used for one specific trip or for all trips.
- *Captcha support:* Captcha can be used on free, paid or both free and paid trips.
- *Tax support:* Event Booking is allow administrators to set up tax rates for bookings.
- *Emails notification system:* allows sending confirmation email to registrants and notification emails to administrators when someone registers from front-end.
- *Registrants management:* Booking allows administrators to manage all the registrants from back-end of the site, and to create new, view, edit, or delete registrants. Registrants can also be exported into CSV format and viewed using an MS Office program. Permissions for special users can be managed for registrants from front-end, thus preventing them to access the back-end of the site). Users can also use the CSV export feature to export registrants of an event to a CSV file.
- *Registration History:* Registrants can login to their accounts to see registration history and modify registration information if needed.

- *Trip Custom fields:* allow administrators to create custom fields in order to display extra information about the booking, besides basic information like title, price, date, and such like.
- *Mass Mail:* With Mass Mail feature, administrators can send an email to all registrants from the back-end of the extension without having to use a newsletter extension.
- *Waiting List feature:* When a trip is full, users will be able to enter information to join a waiting list. If someone cancels their registration, admin can then email users from the waiting list so that they can register for the trip.
- *Prevent duplicate registration:* This option prevents a user from registering twice for the same service. The facility can be turned on or off from configuration.
- *Members discount* and Early bird discount options.
- *Cancel registration:* If an administrator enables this features, registrants can cancel their registration before a certain date.
- *Option to send attachment file* to registrants after they completed registration.
- *Auto reminder feature:* Booking allows an administrator to set up the reminder feature so that registrants are reminded about the event before X-days prior to actual date.
- *Custom fields feature:* Booking allows administrators to create custom fields to collect information about individual or group registrants. A Custom Field Fee feature allows dynamic calculation of total price for service registration based on the options which registrants choose during registration.
- *Social sharing:* Integrating facebook like buttons and other buttons to enhance social sharing. Users can share the service with other users on social sites. In this way the service will receive free publicity and can be visited by many other users .

- *Invite function*: The function is integrated so that users can invite their friends to view and register for services.
- *Search plugins*: to allow trips to be searched via standard search.
- *Content plugin* to display details within bookings.
- *Content plugin* to display individual registration forms for an event within a booking.
- *Option to hide* past trips automatically.
- *Setting at Event Level*: One can set up a Paypal account, Notification Emails, Thanks Message, Confirmation Email message on an Edit/New screen. If one of these pieces of information is left empty, the default configuration from configuration area will be used.
- *Locations management*: Booking allows one to create and manage trips. When users view a booking from front-end, they can see location information, see this location on Google Map and get direction to this location using Google maps.
- *Google Map integration*: Booking is integrated with Google map to allow registrants to view locations of events on the map.
- *Auto fill-in registration form* with data stored in user profile.
- *Registration history plugin* which allow registrants to see and edit all bookings which they register.
- *Newsletter integration*: Online trip booking integrates with popular newsletter extensions such as CC Newsletters, Acajoom Newsletters, AcyMailing Newsletters. It allows subscribed registrants into the newsletter system so that an administrator can send a newsletter to them as and when required.

5 Carpooling Scheme

This pilot action will be intended to encourage employees of the Ministry for Resources and Rural Affairs (MRRA) who commute daily to their offices in Floriana and Valletta by making use of collective modes of transport. Over the past couple of decades, Malta has been suffering a decline in the patronage of its public transport service, offered up to 2011 under a monopoly by an association of individual owners/drivers. Routes linking new areas to the public transport network have grown alongside the main traditional routes, but a continuous deterioration of the level of service over the years contributed to a steady increase in the use of private cars. As a result, Malta has one of the highest motorisation levels in the world.

The public transport reform implemented in 2011 introduced a new range of services, operated by an international transport company, Arriva. However, some have seen this radical reform as a lost opportunity that failed to address a number of issues. The high expectations that had accompanied the reform process were not satisfied, although further improvements along the months have ameliorated the service and are slowly changing the public perception.

The reasons why the bus service is deemed to be inconvenient from certain areas of the island are mainly the long time it takes to arrive in Valletta, either because of the long routes taken to arrive at the destination or the number of times one would need to change buses. As a result, a high percentage of commuters still rely on the use of their private car to travel to their office. This compounds the daily transport problems encountered, increasing congestion, air pollution and costs for the employees.

5.1 Congestion in Valletta

MIEMA is proposing to use its participation in this MED project to set up on behalf of the Ministry for Resources and Rural Affairs (MRRA) a carpool or car sharing system which can contribute to the reduction of traffic congestion and address environmental concerns. In this way MIEMA can narrow the gap between private transport and

public transport. This may be another local measure to combat climate change by improving transportation efficiency.

Those participating in this exercise can benefit from other gains such as:

1. increasing safety on the roads;
2. reducing traffic congestion and ultimately reducing the travelling time;
3. a reduction in noise associated with traffic.

Whilst acknowledging that public transport remains the preferred option to cut down on the number of cars on the roads, experience has shown that until the bus service is significantly improved many commuters will continue to use their private car to go to work or to take their children to school. Before commuters are convinced of the reliability of public transport – with the duration of a bus trip taking little more than using one's private car to reach the desired destination – the number of vehicles on the road will remain high.

In view of this situation, following several discussions with the Ministry and consultations with all the relevant authorities and stakeholders, it was decided to offer MRRA employees who commute to their office by private car an option of joining a new carpooling scheme, designed specifically for the LiMIT4WeDA project. The new scheme has three main features which are described hereunder.

5.1.1 Web-portal

In order to operate the scheme, it was essential to develop a web-portal to promote it. The Internet portal will be launched and maintained for a period of one year after launch. Features include:

- Rules for participation in the car sharing scheme;
- Possibility to include languages, eligibility for participation, conditions and behaviour, sharing of expenses, cancellation policy, disclaimers, data protection, terms of use, and operator contact information;

- Start-up wizard with registration of interested employees;
- Advance information on trip identification and participation;
- Information on times and locations of pick-up and drop-off points;
- A matching function and trip organisation;
- A parking space booking function;
- A discussion forum;
- A news section – informing about fuel efficiency;
- Measures, flash news and announcements.

5.2 Technical Features within the website

Once logged in as 'root', one can basically control everything. First thing to do is to define the destinations and offices to which users shall drive or be driven to. Since one or more offices can be at the same 'address' or 'destination', another thing to do is to create addresses. This is accomplished in Administration by clicking on 'Destinations' in the sidebar. Here, one can see a list of current addresses, and can review, edit, remove and add new ones.

5.2.1 Destinations

To create a destination, the administrator will enter the name of the destination. This is just a name to help users to recognise the address when creating offices. The number, street, locality and country are to be entered separately in the defined fields. The number can also be the name of the building. When entering the locality, if all the other fields are filled in, the system takes a second or two to recognise the locality. If it is entered incorrectly, the user will notice that it will try to find the best match, or display an error if it just cannot find it.

The validation is performed against the Google Maps server, so if one is testing in an environment without an active internet connection, one will be informed that the locality is invalid. Users can click 'Add Destination' when done, and it will now be listed on the left, and it can be edited or deleted with another click. There is also a cancel feature in case the user changes their mind.

5.2.2 Offices

An administrator can define the offices. The list of offices is what the users can actually see. The office has the address defined by one of the destinations entered and a start and finish time. Offices also have an associated name. A feature allows an administrator to specify times in 24 hour notation (08:00, 16:00, etc). Just like the destinations, the administrator can click on 'Add Office' when done. Again, clicking on the office on the left will allow editing or deleting of the office. This UI is consistent all over the application as will be evident from the list of users.

5.2.3 Users

A 'Users' button will show a list of registered users. Here one can see but not change some details about the users. The only alterable detail is the user privilege. Level 1 is default user level.

Levels above 5 allow administration access, limited by the grade above 5. Level 7 allows some minor administration such as broadcast messages and settings, while level 9 allows total access, just like the default 'root' user.

Changing or deleting the level of the 'root' user will lock one out of the administration. One must make sure to have another administrative user before removing one. The value in the database itself will have to be changed, which is neither easy nor safe.

5.2.4 Details

This is where a normal user can review and edit his or her information. The Password must be 5 characters or more. Ideally, as a default and administrative

user, one should change the password. It can also be left as 'root' (default) for just testing locally.

5.2.5 Messaging

The 'Inbox' shows message threads. The messaging system in this application is scalable yet simple. Users do not necessarily have to send messages to just one other user. This system allows messaging between multiple users and avoids the use of a message title. That way, the messages can be sent by just typing in the message and that's it. It will recognise the list of members of a thread and will show the message threads grouped by the members.

If a message is sent to two other people together, this will show up as a single thread. Any message sent by any of those two users will show up in the same thread. This is a clean way for users to simply send their message and be done with it.

The 'Compose' screen allows users to send a message or create a new thread. The ultra-minimalist interface should be very easy to use. To send a message, users simply click on 'Find users', and simply type in the name, surname or username of the person one is trying to contact in the popin. The 'find' command leads to the display of a list of matches. The query may also consist of part of the name, so by searching for "root", it will still find "root".

Matched users can be selected to whom a message will be sent, and one can select more than one user and also remove them from the list. By clicking 'OK' selections are added to the list of receivers, and the message can be typed and sent using the 'Send'. If the message was sent, the user will be presented with the Inbox. If there were no messages before, the user will now see a new entry with the list of members in it, and this can be clicked to see the messages sent on this thread.

5.2.6 Car Pooling

Now, we will proceed to be a 'Driver' or 'Rider'. The flexibility of the system allows a user to be both of them or just one. Either way, one must define an address. This

address can be either a pickup point, a residence address or anywhere practically. By clicking on 'Addresses' the system will start adding one. The user is allowed to have any number of addresses, but there must be at least one to use the system.

The number (or house name), street and locality can be typed in. The country defaults to Malta, but this can also be changed. Just like in the administration, the locality is validated. Therefore it is necessary to allow a few seconds for the process to finish. This will be 'fixed' so that the user knows that something is happening in the background, because as it is there is no way of knowing that one should wait.

As yet, there might be problems regarding encoding and strange characters may show up, and therefore, when testing, it is best to use localities that have no special characters, such as "Rabat", "Valletta", etc.

5.2.7 Routes

The next step is to define a route if one plans on being a driver. This is required even if one plans on driving just once.

The rather simple 'As Driver', select 'Routes' interface allows the user to create a route from an address to an office. The offices which were defined by the administrator and the newly created address(es) are listed. So, simply by entering a name (such as "My Daily Route") it is possible to choose a departure address and office, and thereafter to create the route by clicking 'Create Route'.

This will take a few seconds, as the route is being calculated and the localities are being listed. When the process finishes, the user shall be presented with a list of localities which the software thinks the user passes from. As a driver, one might actually have a different route, so here the 'generated' route should be reviewed and any false matches should be removed and correct ones added.

When adding a route, the user will see that it is also being validated. So again, a second or two must be allowed for the validation to be complete. To remove a locality, one needs to press the 'x' which appears on the right when the mouse pointer is over the locality name.

The user will need to press 'Route is correct' when the list is finished. Just as one can see at the bottom, the order in which one passes is not really relevant.

When the route is created (which for many, just like adding addresses, is a one time task), one needs to head to 'Trips' to define the trip. This is also probably a one time task.

5.2.8 Trips

A 'Trip' is practically a definition of the route which the user plans on taking and how many riders one can have. So, for example, for a user who has two cars which he or she uses on different days, two trips should be defined, one for each car, unless of course, they have the same capacity.

To define the trip, one simply chooses the route, and the maximum amount of riders one can take.

5.2.9 Trip Planner

The next task is to actually plan trips for particular days. This is what a driver can do, for example, once a week. This can be done by clicking on 'Trip Planner' to see a calendar-like view. Here one can see 4 weeks from the current date. Each day can have one trip planned. By clicking on one of the days it is possible to plan a trip. Planning is just that simple.

The date is automatically set for the selected day and all the user must do, is select the trip (unless he or she has only one trip). Clicking 'Add Trip' confirms. Clicking on a day which has a plan, will allow the user to edit or cancel (delete) the trip.

Also, another button, 'Manage Bookings', appears at the bottom. A click will open up a panel which will show a list of people who have booked that trip. The user can accept or reject bookings here. The user will receive a message from the system when a booking is made.

Users will also receive a message when one accepts or rejects the booking. A rejected booking is not reversible, and the rider will have to book again.

1) If there are no bookings a 'loading' will remain visible in the panel. This does not affect functionality at all, but may mislead the user. This should be tested when bookings are made to see the actual functionality.

2) A more serious issue is the one where bookings made on the last six boxes of the calendar, do not show up. If a trip is planned on those days, they will only show up as they go past these 6 days and are less than 3 weeks away.

5.2.10 Finding a Trip

To test this feature, one should ideally create another user by opening another browser and navigating to the same address and clicking on register. It will be necessary to make sure that the address locality entered is on the list of the route created by the other user so that it will be possible to see the searching and booking in action. It is necessary to plan some trips by this user, otherwise no results will show up.

As a rider, there is the natural functionality of finding a trip to work. This is a rather simple task of just selecting your departure address and your office, and clicking 'Find Matches' in the 'Find Trips' section. A list of matching trips is shown. As one is looking for trips to a particular office and not destination, one will find that all matches have the same the same time as the selected office/s.

5.2.11 Bookings

Finally, there is the 'Bookings' section. Here the rider will see something very similar to a driver's planner. The difference here is that the bookings for the users show up on the booked dates. The bookings which have not been confirmed yet will have a dotted bottom border. Those that have been confirmed will have a solid line. Clicking on a booked date will allow the user to cancel the booking. Clicking on any other date will show the user the address and office just like the search form. Here the user can easily visualise the days and simply click 'Find Trips' which will automatically find all the matches for that day.

5.2.12 Formation of Carpools

A fundamental component of the scheme consists in the formation of the carpools for commuters to Valletta and Floriana.

5.2.13 Reserved Parking Area

To enhance the success of the scheme, the MRRA has allocated a dedicated parking area to be reserved for users of the carpooling scheme. This incentive will serve to greatly boost the popularity of the scheme, as indicated in the survey carried out as part of the project.

5.2.14 Intermodal Transport across Grand Harbour

Apart from the carpooling pilot action designed for employees of the MRRA, it was decided to implement an alternative transport route across the Grand Harbour that could take tourists, commuters and the general public much less time to reach Valletta from the southern districts of the island. Accessibility to Cottonera was thus greatly improved through a combination of sea and land transport modes.

This pilot action was designed to offer a solution to commuters from Cottonera who had been complaining of the inconvenience of the new public transport service options following the reform of June 2011, which resulted in excessively long travel times during the rush hours. By exploiting the introduction of a new lift service at the Upper Barrakka in Valletta, inaugurated on the 15th December 2012, FTZ could design and promote the implementation of a new public transportation route from the southern harbour districts (WDAs) to the capital city. This new transport mode combining sea and land transport should be popular with commuters and tourists alike.

5.2.15 Car Sharing

Following discussions with the Isla Local Council, a decision was taken to offer car parking facilities to commuters who would like to make use of the sea transport options introduced recently.

5.2.16 Sea Ferry Transport

To exploit this new mode of transport introduced in 2012 and increase its patronage, the second MIEMA web-portal developed for the project provides information about the different options available to commuters travelling to Valletta from the Cottonera and surrounding districts.

5.2.17 Traditional Boat Crossings

A second option of sea transport across the Grand Harbour consists in the traditional dghajsa tal-pass.

5.2.18 Barrakka Lift

The final stage of the trip for commuters travelling to the capital city is made up of the Barrakka Lift, inaugurated in December 2012. This provides a fast and efficient connection between the Floriana and Valletta waterfront (Lascaris Wharf) and the Upper Barrakka next to Castille Place, at the entrance to the capital. The lift service operates daily between 07:00 and 21:00.

Figure 7 Launch of the Upper Barakka Lift



Source: Times of Malta

In just 23 seconds, the lift takes passengers from the waterfront, 100 metres away from the harbour ferry landing place, to within 200 metres of the Office of the Prime Minister. The two cabins can each carry 21 passengers, making it possible for commuters to cross from Cottonera to the heart of the capital city in a matter of a few minutes. The 58 metre distance of the height of the bastions covered by the lift does away with the need for one to go up the steep roads to the city on foot or by car.

The lift's location, around 500 metres away from the Cruise Liner Terminal, also provides cruise passengers fast access to the capital

6 Conclusions

The Malta Intelligent Energy Management Agency, through the LiMIT4WeDA project, will provide innovative transport solutions that will alleviate the current problems of traffic congestion, dependence on private transport, waste of resources, and high greenhouse gas emissions. The pilot project will consist of a carpooling scheme, utilisation of sea transport in the Grand Harbour area, and judicious use of intermodal transport for commuters and tourists alike. The initiatives will also contribute to the regeneration of traditional crafts and skills, create employment, and promote economic activity in the depressed Southern Harbour Region of Malta.

The pilot projects will integrate with other initiatives such as the Barrakka Lift, the transport scheme and link to the Northern Harbour Region, as well as networking efforts among the various municipalities concerned. It will also support the idea of a multicentric node linking Valletta to the three historic cities of Bormla, Isla and Birgu. The node will support cultural and innovation exchange, as well as promote economic development at a local level. The whole concept will tie in exceptionally well with central government's vision of a shift in use and a new beginning for the Grand Harbour Region of Malta from a military base to a haven of peace and regeneration, and one that looks far ahead and goes beyond the 2020 threshold. It is also a vision that promises a very bright future for this largely depressed corner of the Maltese islands.