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CONSULTANCY SERVICES FOR THE DEVELOPMENT OF A SUSTAINABLE URBAN MOBILITY PLAN (SUMP) FOR THE GREATER URBAN AREA OF THE CITY OF LIMASSOL

FINAL SUMP REPORT – SUMMARY

Karlsruhe, 13.06.2019

Ευρωπαϊκή Ένωση
Ταμείο Συνοχής
Κυπριακή Δημοκρατία
Διαρθρωτικά Ταμεία
της Ευρωπαϊκής Ένωσης στην Κύπρο
Τμήμα Δημοσίων Έργων

The project is co-financed by the Cohesion Fund of the European Commission and the Republic of Cyprus

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Client:

Republic of Cyprus

Public Works Department, Ministry of
Transport, Communication and Works

Contractor:

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Transport Consult GmbH
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76131 Karlsruhe
Germany

In partnership with:

PTV Planung Transport Verkehr AG - Germany
TREDIT SA - Greece
ALA Planning Partnership - Cyprus

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Content

1 Introduction

The government of CYPRUS has taken up the idea of Sustainable Urban Mobility Plans (SUMP) and is going to undertake SUMPs for all urban agglomerations in CYPRUS. The situation in the country is generally characterised by a remarkably high use of cars, at the heavy expense of other more environmentally friendly modes of transport, and the subsequent numerous negative externalities that are caused by this great imbalance. This state of things also strongly characterizes the current transport system of the city of Limassol and is thus in urgent need for appropriate remediation and restructuring. The purpose of this project is to develop and provide a Sustainable Urban Mobility Plan for Limassol, on the basis of the internationally adopted SUMP principles, which have been and are being successfully applied in several European cities over the past few years. The Sustainable Urban Mobility Plan, in contrast to other past traditional transport master plan approaches, institutionalises both methodological and social aspects of transport planning under consideration of the common sense about existing deficiencies of transport systems in urban areas. A strong characteristic of a SUMP concerns the great efforts made and channelled to generate awareness, understanding and consensus amongst all involved/affected parties and in this respect, it seeks to promote the active involvement of citizens and stakeholders in the process of problem analysis, development of objectives and definition of solution options, which will ultimately influence to a great degree the success of the project.

The SUMP for the Limassol area has followed the same set of overall objectives as defined by the EU White Paper on Transport, the SUMP guidelines and the Terms of Reference (ToR):

- **Economic Efficiency:** Improve the efficiency and cost-effectiveness of the transport network in providing for the transportation of persons and goods.
- **Environmental Sustainability:** Minimise emissions and pollutants associated with transport.
- **Accessibility and Social Inclusion:** Ensure all citizens are offered transport options that enable access to key destinations and services.
- **Safety:** Ensure personal safety and security within the transport system.
- **Quality of Life:** Contribute to enhancing the attractiveness and quality of the urban environment and urban design for the benefits of citizens, the economy and society as a whole.

The project “Consultancy Services for the Development of a Sustainable Urban Mobility Plan (SUMP) for the Greater Urban Area of the City of Limassol” was commissioned by the Public Works Department of the Ministry of Transport of Cyprus co-financed by the EU Structural Fund – The Operational Programme Competitiveness and Sustainable Development 2014-2020. The project officially started on 13 March 2017 and was successfully concluded on 13 June 2019. The consortium that carried out the consulting services consisted of:

- PTV Transport Consult GmbH, Karlsruhe, Germany
- PTV Planung Transport Verkehr AG, Karlsruhe, Germany
- TREDIT SA, Thessaloniki, Greece
- ALA Planning Partnership, Nicosia, Cyprus

The Final SUMP Report is the summarising description of the whole process of development of the Sustainable Urban Mobility Plan; the analysis of current situation in terms of mobility and mobility impacts; the Projections of future development (socio-demographic, economic, spatial); the Derivation of current and future deficiencies and problems (according to objectives); Development of consistent solution strategies (under the framework of defined objectives and desired achievements); Derivation and definition of measures and projects (under the criteria of economic efficiency and environmental goals) in all fields of transport including, institutional and organizational ones; the Choice of measures and projects (based on assessment and appraisal).

1.1 Area of intervention

The Limassol SUMP project started on 13/03/2017 and was concluded on 13/06/2019, a total of 27 months. The Study Area included six municipalities and eleven communities (as shown in Table 1) that together make up the ‘greater’ urban area of Limassol. This Study Area covers a total area of 222.5 sq.km and has a population of around 205,000. Figure 1 below illustrates the Study Area.

Municipalities	Communities	
Municipality of Limassol	Pano Polemidia	Pyrgos
Municipality of Mesa Yitonia	Palodeia	Tserkezoi
Municipality of Kato Polemidia	Mouttagiaka	Trachoni
Municipality of Agios Athanasios	Agios Tychonas	Kolossi
Municipality of Yermasoyia	Parekklisia	Erimi
Municipality of Ypsonas	Moni	

Table 1: Municipalities and Communities in the Study Area

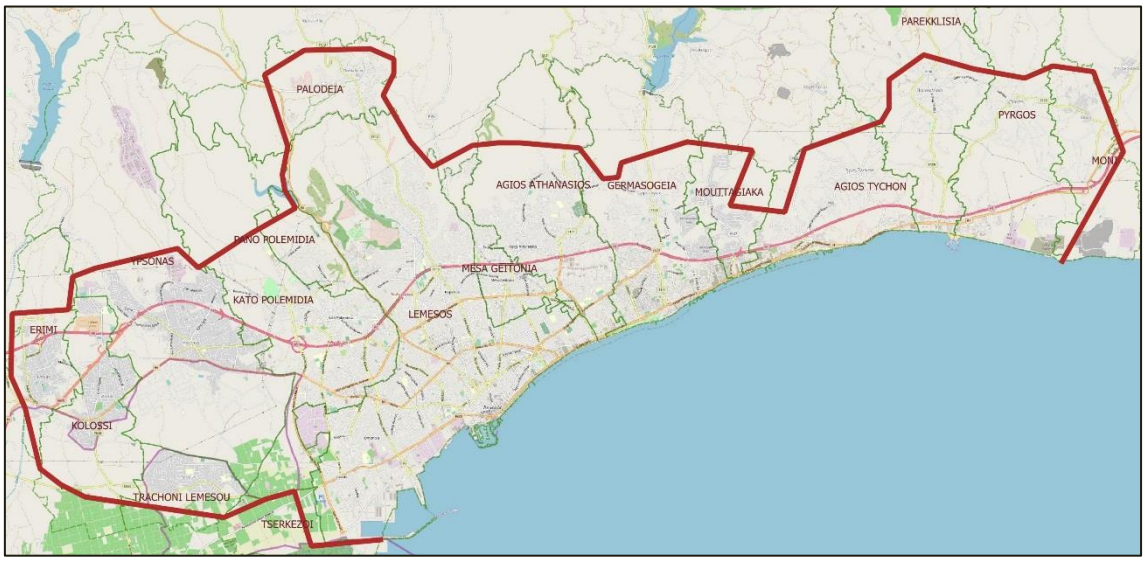


Figure 1: Map of the study area

1.2 The SUMP stakeholder engagement groups

Three different categories of project committees were formulated, which are aligned with the three levels of participation: the Project Steering Committee with 6 members, the Key Stakeholder Committee with 19 members and the wider stakeholder group. Each category has fully involved in the SUMP study implementation process having their specific contribution and influence in the step-by-step decisions.

1.3 Project outcomes (Deliverables)

The whole process of developing the SUMP for Limassol was thoroughly documented in the accompanying 22 deliverables of around 1600 pages. Those project deliverables contain more details on the respective working steps and topics.

2 The Necessary Paradigm Change

The transport system of the City of Limassol is characterised by the predominant mode of transport i.e. the car. Hence, the society, the residents of Limassol are car-dependant. The situation in Limassol is not different from other metropolitan areas or cities in Cyprus or the country as a whole.

The car is perceived as the only suitable mode providing flexible mobility, access and freedom to choose destinations, activities and time of travelling. Other modes of transport, namely the non-motorised modes walking and cycling as well as public transport currently have very low shares of the total number of trips; the modal share of trips by car is 91.8%, by bus only 1.8%, leaving 5.7% for walking and 0.7% of trips by cycling. The attitudes of residents and visitors are car-oriented, other modes are perceived as less flexible and only for those, who cannot afford an own car and these attitudes and perceptions are of course reflected in the respective mobility behaviour. The overall car ownership index is high with 0.58 (i.e. 580 cars per 1,000 residents), almost all H-H dispose of at least one car (more than 95%).

Transport supply, provision of networks and services is similarly unilateral. The road networks in the Limassol metropolitan area are well-developed, reach every corner of the area, allow access by car to all destinations and at most destinations provide easy and cheap car-parking facilities.

Networks and services of other modes are far less developed and provide a far less comprehensive accessibility of the territory of Limassol's metropolitan area. This is the case for public transport: at the outskirts of the city, lines and services become insufficient with major service gaps, distances to next bus stop often at or above 1,000m, low service frequencies and altogether an insufficient spatial access of the territory to public transport. Frequencies are low, most lines do not have regular headways. Particularly outside peak hours, services are irregular, and hardly allow for connecting services of different lines without long waiting times. Service times are also not sufficient. For a Public Transport system to be attractive and to encourage people having access to a private car to use public transport, the services have to be comprehensive, continuous and interconnected, allowing the individual user to travel by public transport on the whole chain of trips of the average day. This very clearly is not the case in Limassol. Pedestrian facilities are scarce. Cycling facilities do practically not existing at all. Obviously, the non-available or non-adequate infrastructure and services do not encourage other modes of transport than the car.

This is a vicious circle, the population is relying on the car, is dependent of the car, uses the car wherever possible and reduces all other modes to very little modal shares. Other modes are marginalised in Limassol. The road space, the public urban space is not used by people but is perceived as being only destined for motorised vehicles. The provided PT services are running more or less empty. Similarly, walking and cycling: the population is not very enthusiastic about walking or cycling longer distances than from the car park to the door, the provided infrastructure also does not encourage to walk and cycle.

Of course, today's car dependency in Limassol results in numerous problems and criticalities need to be properly addressed, that can be categorised in the main fields of:

- Road safety: the number of accidents caused by motorised vehicles, the high number of accidents, the high number of fatalities and seriously injured (e.g. 17 deaths among which 8 pedestrians and 3 motorcyclists and 1 cyclist and around 150 serious injured in 2017), large number of accident accumulation zones along major corridors and major junctions in the city centre is one side of the coin.
- Accessibility: accessibility in Limassol is limited for those with no direct access to the car: larger supermarkets at the outskirts, only accessible by car at the detriment of the smaller local shops, where everybody can walk to, offices and work places moving to remote areas not served by public transport etc. Of course, as a result of this, most households dispose of private cars and household members use it for each and every trip. The part of the population without direct access to a car, the younger than 18, the older who cannot drive anymore, the unable or simply those who cannot afford a car have reduced accessibility. They are excluded from social life, public transport services are being reduced than improved, local shopping facilities disappearing, walking and cycling being dangerous.
- Quality of life: urban space for people to use, to linger, to sit and talk, clean air, lack of unnecessary noise, pleasant environment without visual intrusion from exorbitant road infrastructure or a vast quantity of parked cars along both sides of all roads and streets, no impediments or barriers for free movement of people etc. In Limassol, today many of these components of quality of life for Limassol's residents and its visitors are being impeded by excessive car traffic.
- Environmental sustainability: Sustainability has three components, environmental, social and economic sustainability. In Limassol, environmental sustainability is clearly put at danger by the uncontrolled and massive motorised traffic, the enormous fleet of cars compared to the number of residents and the age and quality of engines. CO2 emissions from transport grow and do not diminish. On top of this, the current transport system of Limassol also limits the social environment (see above) and the built environment in the city.
- Economic efficiency: the necessary mobility costs are comparatively high, as individual mobility is mainly provided by private individual vehicles, normally carrying only one passenger, losing time in congestion and in the search of parking facilities. The potential economic development of Limassol is limited as capacity for the private motorised transport has been reached and capacities cannot easily be expanded further; the city risks to lose its attractiveness for further economic development through settlement of new companies and through attracting more tourists and visitors.
- Innovation: Innovation in transport is the development of new services and supply and the related change of demand, like car sharing, bike sharing, Mobility as a Service, car-pooling, electric vehicles, autonomous driving to name just a few that are currently evolving all around the world. Limassol has nothing of that, no car-sharing, no charging infrastructure for electric vehicles, no shared space.

All these issues and problems can already be experienced in Limassol today. If nothing will be changed, then these issues will aggravate and will become worse, accidents and lack of safety, congestion, time

lost, emission of pollutants, noise etc., as the population will increase, mobility will increase, but the space for traffic is limited. In the projections of mobility patterns until the year 2030, in the reference scenario, i.e. the scenario without any major changes to current trends, the situation will deteriorate.

Change is necessary. This has to be a complete change of paradigm, a comprehensive and fundamental change, starting with local politicians, public administrations and public servants, starting to change priorities in transport development and resulting in changing the attitudes, the perception and the travel behaviour in Limassol. What is necessary is an integrated urban mobility plan, taking all influencing factors of mobility into consideration, land-use development, economic development, development of awareness, attitudes, acceptance of sustainability issues and actions, personal and individual actions, i.e. changing of one's own mobility behaviour. Many of the latter points are related to marketing, to promotion of a sustainable way of moving and behaving. But a lot is related to providing the alternatives, physical alternative in form of modal networks and services for public transport, for walking and cycling safely and comfortably. And this change has to start with decision-makers, planners. They have to act first, adapt their own behaviour and adapt the planning and development routines. Only then can this paradigm change also be accepted by other residents and visitors in Limassol.

3 The Vision

3.1 The Vision of a Sustainable Transport System for Limassol

The Vision has been defined by the Key Stakeholder Committee, taking on board the results of the public consultation events. The overall objective in the development of a Sustainable Urban Mobility Plan (SUMP) for the City and Greater Urban Area of Limassol is the desire and the need to improve mobility and quality of life for the citizens and visitors of Limassol and the region, allowing a future development of the area to be economically, environmentally and socially sustainable.

In developing the plan, stakeholder and citizen involvement was planned from the beginning of the project and was envisaged to accompany the whole process of SUMP development. Apart from analysing current conditions, setting up analysis and planning tools, the most important basis for the SUMP is the development of a common Vision for the future development of mobility in the City of Limassol and its Greater Urban Area, a Vision of how transport should develop, a Vision of how transport and mobility can contribute to a sustainable future for the area. Furthermore, specific objectives have been defined, which indicate the kind of changes the city needs. These changes must be measurable; thus it is necessary to define the appropriate objectives and measurable indicators.

Both, the Vision itself, but also the more specific objectives were developed by stakeholders and the residents of Limassol based on the EU White Paper on Transport and the supporting SUMP Guidance:

1. The city needs a transport system, which will satisfy the increased travel demand.
2. Residents and visitors should adopt new behavioural models.
3. The city should adopt policies restricting the use of private vehicle.
4. The city should adopt a new town planning model for densities' and land uses' management or propose solutions for achieving and managing high densities.
5. The city should adopt solutions regarding the travel demand for work purposes (daily peaks).
6. The city should acquire an adjustable mobility system, adopting measures for the seasonal peak management.
7. The city should adopt a mobility system accessible for specific target groups i.e. the elderly people and people with disabilities.
8. The city should focus on the infrastructure of sustainable transport modes.
9. The city should focus on the gateways' management.

Limassol's SUMP should be guided by the following High-Level Objectives:

- Road Safety: the High-Level Objective is to reduce the number of accidents, the severity of accidents and particularly reduce the accidents involving children and the young generation; furthermore, the Vision will be to increase the perception of safety on Limassol's road network.
- Accessibility and Social Inclusion: the High-Level Objective is to increase the accessibility of all destinations in the territory of Limassol by other modes than the car, providing comparative travel times,

comfort and costs for the whole daily mobility; this includes the development of the public transport system both in time (service times and frequencies), as well as in space (bus stops and hubs), regular time tables and improved connectivity between different lines, but also services on demand; it includes the development of more and safer pedestrian facilities and a continuous and comprehensive network of safe bicycle routes; equal provision of free and accessible public space for pedestrians, cyclists and motorised vehicles; direct and unobstructed access to major destination for pedestrians, particularly the coastal front.

- Quality of Life: the High-Level Objective is to reduce the negative impacts and the influence of motorised traffic on the Urban life, by providing more car-fee areas (pedestrianisation), areas with low car impact (shared space, traffic calming); better spatial mixing of activities through the provision of destinations like shops, leisure facilities closer to where people live and work in order to reduce trip distances, provision of more public space for non-traffic use like parks and green areas, improvement of the coastal front and the direct access to it by walking and cycling and by public transport; proper monitoring and organisation of public transport operation, enforcement of traffic rules, creation of "environmental zones".
- Environmental Sustainability: the High-Level Objective is to have clean air and acceptable noise levels inside the city, where people live, work and linger, the city of Limassol not contributing to Greenhouse Gas emissions more than the European average, to minimise the energy consumption from transport in Limassol and the use of non-renewable resources.
- Economic Efficiency: the High-Level Objective is to provide access to all destinations in Limassol without unnecessary time losses through congestion, by providing alternative modes of transport (public transport and non-motorised transport), including work places, shopping and leisure facilities, better integration of economic activities with land-use/spatial planning.
- Innovation: the High-Level Objective is for Limassol to become an engine for innovations, like electric vehicles, new innovative forms of transport and mobility.

Each of these high-level objectives was associated with a number of qualifying statements. These expectations were further discussed, were ranked by level of importance by the Key Stakeholders, finally identifying the most relevant expectations for the future development of a sustainable transport system in Limassol. Some of the most relevant expectations included:

- Reduction of road accidents
- Reduction of accidents involving pedestrians and cyclists
- Reduction of accidents involving students
- Wider pedestrianisation of the city centre, parking limitations and parking spaces creation
- Enhancement of the Public Transport System services
- Reduction of the (irrational) use of private vehicles
- Easy and quick access to all the city's land uses
- Proper monitoring and organisation of the Public Transport system
- Improvement of daily trips (travel time reduce)
- Respect for all citizens' particularities and equal provision of free and accessible space
- Development of a Public Transport system on Demand and increase of service frequency and coverage to support the public transport demand
- Provision of public space to citizens - Creation of open spaces for citizens and promotion of the cultural heritage
- Creation of the necessary conditions and infrastructures in order to encourage short and medium distance trips by alternative transport modes
- Use of new technologies in order to improve citizens' mobility

Based on the highest rated expectations and taking into account the Key stakeholders' opinions, the vision statement was formed as follows in English and Greek, respectively:

"Lemesos to be an accessible, safe, functional and friendly city for its residents and visitors, with attractive, green and quiet neighbourhoods, a lively city centre, numerous spacious and magnificent open public spaces, a beacon of sustainable and smart mobility, facilitating an abundance of economic, business, educational, recreational and cultural opportunities."

«Η Λεμεσός να γίνει μια προσβάσιμη, ασφαλής, λειτουργική και φιλική πόλη για τους κατοίκους και τους επισκέπτες της, με ελκυστικές, πράσινες και ήσυχες γειτονιές, ζωντανό αστικό κέντρο, πολυάριθμους, ευρύχωρους και θαυμάσιους ανοιχτούς δημόσιους χώρους και υπόδειγμα βιώσιμης και έξυπνης κινητικότητας, δημιουργώντας μια πληθώρα οικονομικών, επιχειρηματικών, εκπαιδευτικών, ψυχαγωγικών και πολιτιστικών ευκαιριών».

3.2 High-level Objectives and Targets for 2030

The identification of objectives is achieved by defining the social, environmental and economic improvements required, focusing on what needs to be "reduced", "increased" or "maintained". The objectives are in fact the SUMP's ultimate goal/vision - Objectives at a strategic level, while the respective measures are the means to achieve them -Objectives at an operational level.

The objectives at a strategic level are the prioritised expectations (as the specialisation of the High-Level Objectives in Limassol's case resulted in the formulation of the vision statement), while the operational objectives constitute a first "demarcation" of the alternative measures that may lead both to the achievement of high-level goals and the overcoming of problems and issues in the existing transport system of Limassol.

For the quantification of operational objectives, for the development of strategies, measures and respective implementation plans, it is necessary to define a number of SMART indicators. Targets for these indicators constitute the final step for assessing planning performance and for evaluating the success of the SUMP. In this process, indicative targets were defined for the horizon 2030.

4 The Approach

The development of the Sustainable Urban Mobility Plan for Limassol followed the approved European Guidelines. The following figure depicts the Planning Cycle for a Sustainable Urban Mobility Plan as suggested by ELTIS (see figure 2 on the next page).

The development is in fact a process, a holistic, integrated and participatory process, involving decision-makers, authorities, operators, service providers, all other relevant stakeholders and the citizens in all relevant steps of the procedure. And this process is based on comprehensive tools such as a transport model and a variety of assessment methods, Multi-Criteria-Analysis and Cost-Benefit-Analysis.

The four major parts of this process are covered and were intensively worked through in the development process. The following 4 subsections describe the main points that were of particular importance in developing the SUMP for Limassol.

4.1 Phase 1: Preparing Well

This preparatory Phase consisted of five main parts:

A Stakeholder and Citizen Involvement Plan

The development of the stakeholder and citizen involvement plan consisted of a number of tasks, starting with the identification of specific target groups. The results of this first task were the definition of the Core Stakeholders and of the Wider Key Stakeholders. In the task of Key Stakeholder Involvement Plan, a Key Stakeholder Committee was established with 19 members. The "Wider Stakeholders" have been identified, were recorded, contacted and invited to the Public Participation Events. Six meetings for the Key Stakeholders and five Public Participation events were planned, prepared and documented for the relevant steps of the SUMP process. Additionally, separate meetings were organised with specific target groups such as the Association for Disabled People, the Green Party, the "Movement of Architects for Limassol", the shopkeepers of Anexartisias street, the Association of Residents and Friends of the Historical Centre of Limassol, and with individual citizens or other groups, who requested to meet the Coordinator and/or the Consultants of the project. Finally, stakeholders and the general public were informed about the project, its progress, the strategies and measures via the project's website (http://sump4cyprus.org/), several social media channels, local radio stations and local and national newspapers.

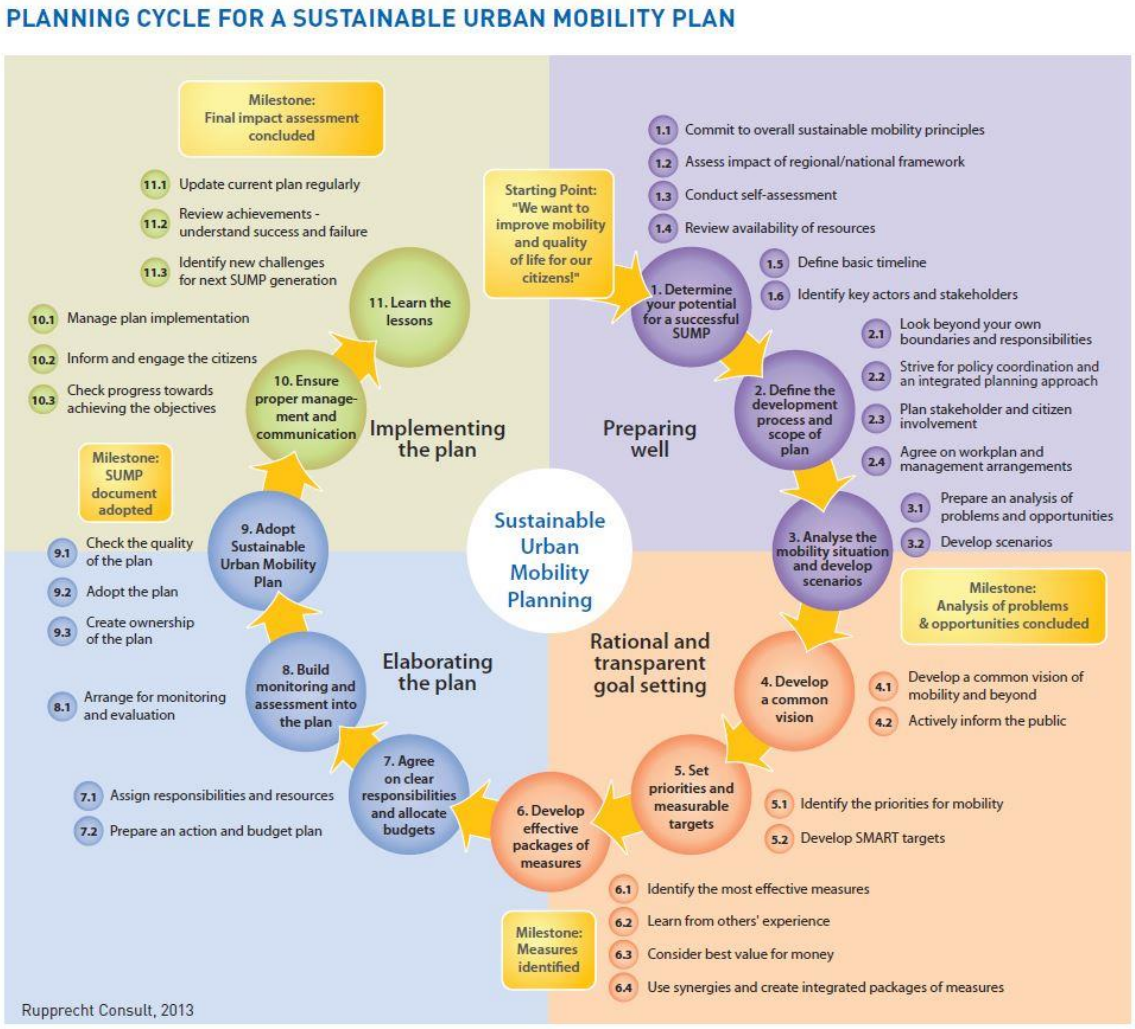


Figure 2: The SUMP process defined by ELTIS

The Review of Existing Relevant Studies and Data

All previous transport and land-use studies were reviewed, as well as environmental studies and other relevant studies and plans forming the current legal and planning framework for the development of Limassol. This included particularly:

- The Limassol Local Plan (LLP) of 2013 defining goals and general development strategy for Limassol and containing sections on transport policy, residential development and housing, building density, commercial, office, industrial development, environment etc.
- The Centre Area Scheme (CAS), being an integrated plan covering in detail land-use and transport strategies and developments for the most important and complex part of the urban area.
- The Policy Statement for the Countryside (PSC) related to some of the peri-urban communities of the study area.

The review included the analysis of existing transport networks and existing transport strategic studies. Finally, the design of a transport model was planned at this stage.

Data Gathering and Collection

Data gathering consisted of collecting, evaluating and processing data about land use, socio-demographic and economic development, an inventory on current transport systems, walking network, cycling network, public transport network and supply, road network for motorised transport as well as data on traffic safety, freight and logistics and tourism.

Furthermore, an extensive programme of data collection and surveys was planned and carried out. The surveys and counts were done in the Typical Season Period and some additional surveys in the Summer Season Period. Surveys were carried out between 20 March and 31 May 2017 for typical Season and 17 July to 06 August 2017 for summer season.

Development of the Transport Model

An integrated and multi-modal macroscopic transport model for the Greater Urban Area of Limassol is the essential planning tool for analysis of current transport supply, transport demand and resulting traffic conditions in the area. More importantly, this model can and was used for the analysis of future exogenous developments, i.e. development of the population, employment, economy and wealth and other socio-demographic developments. Furthermore, the model becomes an important and crucial tool to analyse what happens if, i.e. defining different options (Scenarios) of potential future developments of the transport system and of land use development and analysing the impacts on transport demand, and traffic conditions on the different modes, on environmental, social and economic impacts. The model is the tool to determine the impacts quantitatively and hence serves for definition of scenarios, for quantification of impacts, assessment of effects, comparison of scenarios and selection of the preferred scenario. The transport model is one of the most important bases for the Multi-Criteria Analysis (Scenario Selection) and the Cost-Benefit Analysis (Preferred Scenario Assessment).

The model results include transport demand matrices, volumes of vehicles, passengers, cyclists and pedestrians on links and lines, at junctions and stations, plus parameters like volume capacity ratios, generalised costs for private and public transport, passenger hours and kilometres per transport modes, emissions of greenhouse gases, pollutants and noise, accessibility indicators, public transport operating indicators, public transport coverage and others. These results and parameters are available for all scenarios, i.e. for the base year scenario and for the forecast reference scenario for horizon 2030.

Analysis of Problems and Defining Objectives

The analysis of problems included analysis of data collected and surveyed; data from external sources and data produces by the transport model for the base year case. Surveys were evaluated in terms of current mobility patterns and trip characteristics, parking demand and supply, level of service on the different modal networks, and were complemented by comparison (benchmark), projections of mobility patterns until the year 2030, tourist mobility in Limassol and interdependencies between sectorial trends.

The detailed analyses of current conditions, bottlenecks and current issues included calculation of emissions on the network covering the whole study area, the evaluation of public transport (network and supply, institutional set-up and financial aspects), analyses of accessibility in Limassol with the different transport modes, particularly focussing on central locations and relevant relationships and putting emphasis also on accessibility aspects for groups with impaired mobility. Furthermore, an extensive safety analysis was carried out consisting of network safety management and safety inspections of existing roads. A capacity analysis was carried out for the pedestrian network, for the bicycle network, for the road network including the determination and assessment of volume-capacity ratios. In addition, problems and issues reported by stakeholders were considered, Intelligent Transport Systems were evaluated and responsibilities for road maintenance and road safety determined. Objectives were preliminary defined in terms of a holistic evaluation of identified problems and their interdependencies as well as the derivation of deficiencies and operative objectives as an input to phase 2.

4.2 Phase 2: Rational and Transparent Goal Setting

Phase 2 consisted of the following 4 activities:

Develop a Common Vision, Set Priorities and Targets

The findings from the activities in phase 1 were used to develop a common vision, set priorities and define targets for the horizon year 2030. As noted earlier the vision, the objectives, priorities and targets were not set or defined by the administration or group of experts, but were the result of an intensive participatory process, involving administration, institutions, operators, services providers and all stakeholders influencing or being influenced by the transport system, including special interest groups and the residents of Limassol.

Generation of Future Scenarios

Different scenarios were produced for the future horizon year 2030. The basis scenario is the reference scenario, “do-nothing” or “Business as Usual” scenario. This basic development scenario is the one without any special interventions from the SUMP process. This basic scenario includes all known and accepted developments of transport influencing factors, like population development, both in absolute numbers as well as in composition (locals, foreigners, age groups etc.), economic development including the development of touristic market and other influencing factors provided by authorities and statistical

offices. Furthermore, this basic scenario includes all those developments and projects, that are currently already under construction, or are planned and have an approved financing and expected to be completed by 2030.

Additionally, different options were defined, where the SUMP would influence future development. The different options were defined for two dimensions, on one hand for urban policies, spatial and land use patterns having a high influence on the development of the transport sector, on the accessibility and mobility needs of the inhabitants of Limassol and on the potentials for a sustainable mobility with a decreasing dependence on cars. On the other hand, different transport mobility policies were defined including policies, projects, restrictions and incentives.

For the urban policy scenarios, the following 3 options were defined:

I. City Sprawl (Expected) – low mix of land uses, basically not influencing the existing trends
II. Targeted Development – directing growth to specific area in Limassol with development potential
III. Poly-Centric Development - mix of land uses in all the centres (Limassol and other municipalities)

For transport and mobility policies, the following options were defined:

A. Improvement of Car Traffic conditions with the aim to reduce negative impacts
B. Further improvement of Car Accessibility with the aim of providing better access by car for all groups of the population
C. "The Carrots" – Improvement of alternative modes of transport, increasing their attractiveness and aiming at convincing users to switch away from the car
    1. Moderate
    2. Advanced
D. "The Sticks" – limiting or impeding car traffic with the aim of reducing the car traffic volumes particularly in sensitive areas.
    1. Moderate
    2. Advanced
E. Combination of "The Sticks" and "The Carrots", again moderate and advanced.

This resulted in a matrix of 24 possible combinations, i.e. future development scenarios. Out of these 24 possible scenarios, in the following process, the Stakeholders (the KSC and the SC) selected first a maximum of six scenarios for further analysis. These final agreed scenarios formed the basis for the subsequent steps of the development of the Sustainable Urban Mobility Plan for Limassol.

Development of Scenario Models and Evaluation

The 6 resulting scenarios were defined in greater detail and were modelled with the transport model. This included the changes to the urban policy, i.e. spatial location of development of residents and workplaces, as well as the different transport mobility options, i.e. changes to transport networks, transport services, costs, travel times, parking possibilities etc.

The model results were calculated in terms of indicators for numerous aspects, e.g. mode shares, trip distances, average speed, volume/capacity ratios, level of service, public transport indicators, emissions of GHG and pollutants, emission of noise, were displayed in maps of volumes, passengers, LoS, impacts of individual measures and others. Scenarios were compared, and impacts reported.

The model results for the 6 scenarios formed the input for the Limassol SUMP Multi-Criteria Analysis (MCA) for Scenario Evaluation. The MCA approach enables the comparison of different options using criteria of different nature as it is the case for examining sustainability. In fact, each policy objective set in the Limassol SUMP corresponds to a main analysis criterion whereas the majority of the operational objectives define a sub-criterion in the MCA. Finally, the indicators used for measuring the various effects of the selected interventions in each SUMP scenario are also used for determining the score corresponding either to the effects of these interventions or to the targeted goals.

The MCA results, which rely on weight factors for each criterion and sub-criterion assigned by a panel coming from the nineteen members of the Key Stakeholders' Committee, rank as first option Scenario 6 followed by Scenario 4. Relating to the five high-level policy objectives scenario 6 ranked best in each of them:

- Economic Efficiency: scenario 4 and 6 are the best performing scenarios, particularly looking at vehicle kilometres and mode shares, travel speeds for PT.
- Environmental sustainability: scenarios 6 – along with 4 - perform by far best, particularly in terms of emissions, mode shares, travel distances, travel speeds for PT and bicycles.

- Accessibility and social inclusion: is again best achieved by scenarios 4 and 6 for the accessibility by other modes than the car, modal shares, travel distances, travel times in sustainable modes and number of PT passengers.
- Road safety: can be estimated to be improved most by scenarios 4 and 6, as here the car vehicle kilometres are the lowest and more passenger are travelling on the bus.
- Quality of life: is increased most by scenarios 4 and 6, with lowest noise levels in urban environments, lowest pollution levels and lowest vehicle kilometres.

Selection and Appraisal of Preferred Scenario

Based on the results of the previous steps, particularly the assessment of the scenarios with the transport model and the Multi-Criteria Analysis, the Steering Committee selected in majority the highest-ranking scenario 6 as the preferred scenario after the feedback provided by the Key Stakeholders Committee meeting took place on 22 January 2019 and by the Public Consultation Event on 23 January 2019. Scenario 6 combines the polycentric land use approach, where development is focussed in the municipalities of the Urban agglomeration, with the more advanced options of transport policy measures, i.e. "the Carrots" – Advanced and "the Sticks" - Advanced.

The preferred mobility scenario for Limassol included the most advanced and ambitious interventions for the target year 2030, comprised by a mix of carefully selected interventions such as:

- One-way schemes
- Extended pedestrianisations in the CBD area
- Bus-only road network to accommodate bus traffic to the CBT at Andrea Themistocleous str.
- Traffic calming interventions and low speed zones (<30kph) for the residential area
- Re-organisation of the PT network at network level as well as the Quality of service level (frequencies, hours of operation)

The mix of all these measures, policies and interventions was modelled and evaluated through the macroscopic transport model (VISUM) and the results were included in deliverables of the project. The model outcomes were found reasonable and a substantial step to the direction of changing citizens' mobility behaviours by effectively reducing the private vehicle ridership from 91% to 78% while substantially enhancing PT ridership almost tripling it between 2017 - 2030. This alone has contributed to create an urban road network system that is more efficient and productive, therefore less crowded and congested during rush hours in the near future. Due to the nature of the SUMP study, the results cannot be attributed to each single intervention to allow direct comparisons in terms of traffic impact, but it is safe to say that the volume over capacity indications in most road network locations have shown adequate resilience to cope with the extensive pedestrianisations.

A Cost Benefit Analysis (CBA) was then carried out for the preferred scenario, aiming at the comparison of the expected social and economic benefits that will be produced from the adoption and implementation of the specific SUMP with the costs deemed necessary to implement all actions, interventions and investments for this purpose

The final CBA results show that benefits outweigh costs; more specifically the Net Present Values is positive equal to approximately 669.24 million euros. The BCR takes a value of 3.07 which is well higher than the threshold value of 1.0. In case a 2% or 3% discount rate is used, the NPV and the BCR improve significantly. The Sensitivity Analysis results verify the CBA outcome that the specific SUMP scenario improves the wellbeing of the Limassol inhabitants. In all different tests, the CBR value remained well greater than 1.0 and the NPV was positive. Even in the worse-case scenario the BCR value took a value of 2.09. Finally, it should be mentioned that other positive effects of qualitative nature not appearing in the economic analysis calculations and results contribute to the sustainability of Limassol and to the city upgrade. Therefore, the overall recommendation, combining the economic analysis results and the other non-monetized effects, is definitely positive.

4.3 Phase 3: Elaborating the Plan

Formulation of the Draft Sustainable Urban Mobility Plan

Within Phase 3, the task was the Formulation of the draft SUMP. It is based on the previous activities and aims at developing all SUMP elements according to the selected preferred scenario. The Plan elements include the following 10 key aspects of action:

1. City centre detailed traffic management
2. Public transport
3. Pedestrian measures
4. Cyclist measures
5. Parking
6. Freight logistics
7. Traffic safety
8. Needs of specific groups
9. Intelligent Transport Systems (ITS)
10. Strategic Plans and Policies

4.4 Phase 4: Implementing the Plan

Phase 4 is constituted by the following 4 activities:

Strategic Environmental Assessment

A Strategic Environmental Assessment (SEA) has been carried out according to the provisions of the EU Directive 2001/42/EC and the Cypriot law on the Assessment of Environmental Impact of Certain Plans and/or Programs (No. 102 (I)/2005). The objective of the Strategic Environmental Assessment (SEA) is to identify and evaluate all direct and indirect impacts that would be brought about by the implementation Preferred Scenario of the Sustainable Urban Mobility Plan for Limassol and provide documented recommendations on the identification, adoption and implementation of measures to avoid or minimise such impacts.

Preparation of an Implementation Plan, Monitoring and Evaluation Plan

The task of the implementation plan is the listing of projects in a sequence of proposed realisation taking into account the priorities, the interdependencies and the financial capabilities. This includes:

- List of projects
- Short term projects: 0-5 years of implementation, high urgency, short duration of preparation, can be financed more or less immediately
- Medium term projects: 5-10 years of implementation
- Long term projects: more than 10 years of implementation
- Phasing and interdependencies: projects are listed by order of realisation in case of interdependencies
- Financial plan: investment, maintenance, subsidies, potential for PPP

The monitoring and evaluation plan will be developed according to the "Applied framework for evaluation in CIVITAS PLUS II" (2013) guidelines yet considering the specific local conditions of Limassol.

Preparation of a Promotion and Marketing Plan

The preparation of a promotion and marketing plan first consists of some preliminary steps like research and analysis of the current situation, definition of objectives and strategy for promotion and marketing. Furthermore, the promotion and marketing plan aims at developing Key Messages for different audiences and to define optimum communication means and channels. Finally, in this task a strategic business and marketing plan has been formulated.

Model Training Activities and Provision of Software

Model training activities are necessary to allow the authorities in Cyprus and Limassol to use the developed transport model as a planning tool for future changes and developments hence trainings were conducted in March 2019.

Production and Adoption of the Sustainable Urban Mobility Plan

The final SUMP is the synthesis of all the deliverables and the official participation processes followed through the Steering Committee, the Key Stakeholders Committee, the Public Consultations and other meetings organised.

5 Key Aspects of Intervention: Proposed Strategies and Measures

5.1 City centre detailed traffic management

5.1.1 Objectives of Traffic Management Measures

It is obvious that growth in the number and use of motor vehicles, especially cars, is the principal cause that the city of Limassol experiencing congestion, delays, noise, pollution as well as road safety and accessibility problems in its city centre as well as along arterial routes.

Traffic management measures of Limassol SUMP are intended to reduce the above-mentioned problems by reducing transport demand such that the use of private vehicles is reduced (e.g. measures to encourage a modal shift from private cars to public transport, walking and cycling; land-use planning measures which minimise distances between home, work, shops and leisure facilities and so reduce dependency on cars).

Limassol has traffic management measures in place already, but further measures are required in order to cope with future growth in traffic and fulfil the operational objectives of Limassol SUMP. There are many considerations which influence a city's choice of traffic management measure(s):

(a) Economic considerations. Some measures require expensive engineering works to be undertaken and are beyond the resources available.

(b) Alternative goals. Traffic management measures (e.g. new road constructions), which have been implemented so far achieved different goals, than those related with sustainable mobility.

(c) Attitudes of the public. Public support for individual measures varies greatly. Weak public support for an implemented measure can lessen its impact considerably.

(d) National constraints. Traffic management measures could be initiated at the local or municipal level but may require approval by the regional or national tier of Government (institutionalized Local Plan). Guidelines may be set down as to what measures are likely to be approved and those, which will not.

(e) Traffic control and ITS as tools for optimising traffic flow and minimising junction delays.

The single traffic management measures or the combination of measures that be proposed by Limassol SUMP are outlined in the following sections. Some single measures, for example, may spread rather than reduce traffic congestion, shifting the congestion from one part of the city to another. For this reason, a combination of additional measures needs to be introduced at the same time to prevent this eventuality. Similarly, a traffic restraint measure, which deters or prevents commuters from using cars, needs to be complemented by measures to improve public transport, walking or cycling facilities. Rarely does it make sense for a single traffic management measure to be introduced on its own; rather a package of measures is needed.

5.1.2 Key Strategies

In general, the key strategies that dictate and complement the measures detailed below are as follows:

- Convert two-way streets to one-way streets
- Plan transportation networks for all modes of transport
- Speed Limits and Controls
  - Reduce speeds on some identified local streets
  - Implement design features on some streets to reduce speeds
  - Enhance traffic control signs and street markings
  - Increase penalties for speeding
- Stop Controls and Interchanges
  - Re-examine stop controls
  - Improve stop controls
- Education and Enforcement
  - Implement an education campaign
  - Increase enforcement.

5.1.3 Description of Measures

Traffic restricted zone in the city centre

The Limassol SUMP has adopted an approach, which can improve the pedestrian environment through the extensive pedestrianisation of the historical and commercial city centre (core CBD - Central Business District), whilst maintaining access for vehicles, through suitable alternative one-way routes to access from/to and within the city centre (Environmental Zone in the following map – Area A).

A wide range of parking restrictions should be applied to deter the proportion of journeys made by private vehicles to the core CBD area (such as increasing parking charges, reducing the number of roadside and public parking spaces, restricting the building of new car parks and restricting the parking space allowed for new or even existing businesses - see proposed parking policy in Chapter 5.5 below).

A negative aspect of restricting parking spaces or raising charges in the city centre concerns the increase of traffic in nearby streets as motorists seek parking spaces or less expensive ones. To be more effective, parking measures need to be combined with other measures, which encourage a shift from private cars to public transport, cycling and walking (see Chapters 5.2, 5.3 & 5.4 respectively, below).

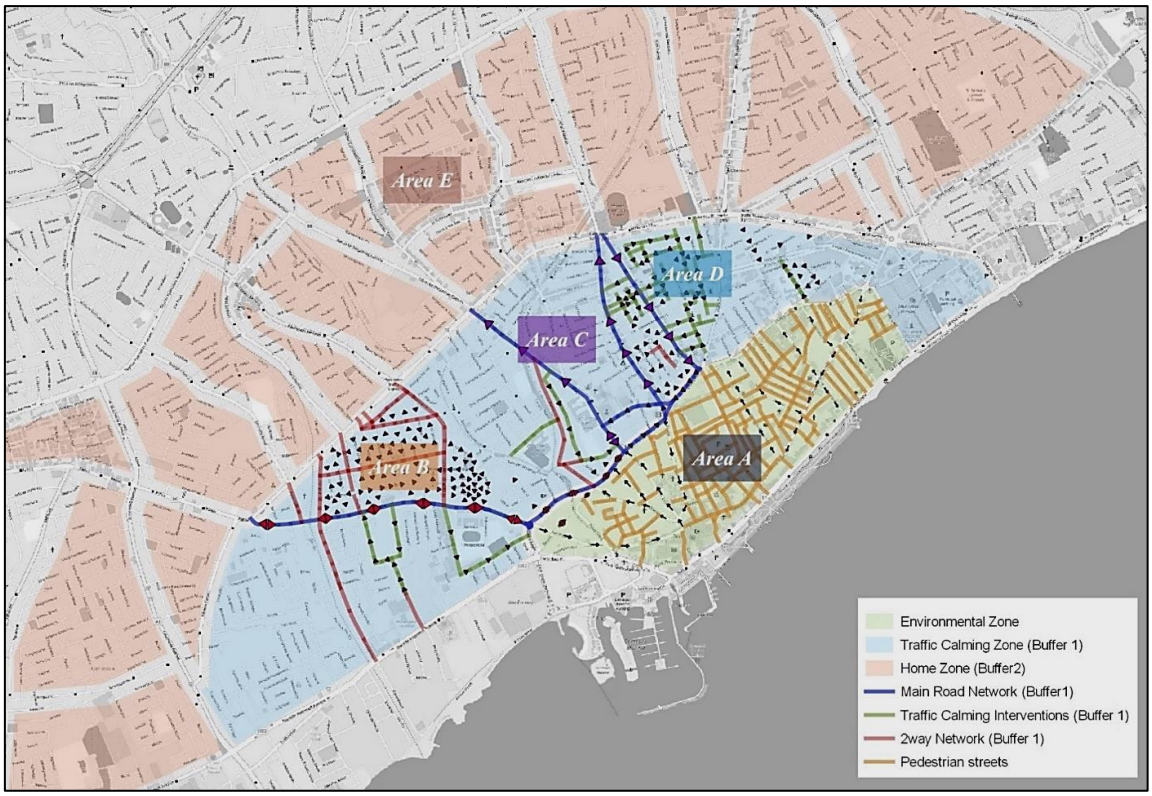


Figure 3: Implementation area of traffic management measures

Traffic calming schemes (calming areas) and area-wide speed limits (pure home zones)

Residential areas which are located in the wider area of the city centre (in the Calming Area Zone and Home Zone as they depicted in the following map) and used by commuters as short cuts require traffic calming measures. Traffic calming measures in residential areas include:

- A system of one-way streets to eliminate through-traffic (speed and volume) making neighbourhoods less noisy and dangerous in combination with the on-going reconstruction of Misiaouli & Kavazoglou Street (Calming Area Zone in the following map – Area B)
- Implementation of the woonerf/shared space measure to protect certain school premises to create a better balance of priorities between drivers and pedestrians, to achieve slowing traffic down, changing priorities and ensuring accessibility for all (Calming Area Zone in the following map – Areas B, C & D)
- Implementation of the measure of 30 kph zones (Home Zone in the following map – Area E). A general 30 kph speed limit is to be introduced for the whole city street network of the area, except for priority streets where a 50 kph limit will be applied. The cost and the time needed to create such zones is a comparative advantage over the choice of using traditional traffic calming zones. Traffic calming

schemes could only be introduced where there is a record of speed related car collisions resulting in injuries.

- Regarding the special needs of children, a specific measure for the needs of primary-school pupils concerns the implementation of safe buffers around primary schools. Within a range of the school entrance, the ways to the school have to be made safe and adequate to the needs of children of ages 5 to 12 years old. Where feasible, the most efficient way to achieve this is through pedestrianisation around primary schools with a radius of 50 or 100 meters. In cases it might not be possible to pedestrianise street segments, alternatives are “No Parking areas” (more details in see Chapter 5.8 below).

The Coastal Avenue schemes

One of the most beautiful assets of the city of Limassol is the seafront. The Limassol SUMP in order to convert the seafront boulevard to the show piece of the Sustainable Urban Mobility within Limassol and show to residents and visitors that Limassol is focussing on a new mobility behaviour, proposes a two-by-two redesign (two adjacent bus lanes on the northern (city) side and two adjacent traffic lanes on the southern (coastal) side). This solution:

- guarantees unhindered bus services without obstructing cars while turning across the bus lanes or even stopping;
- provides shorter and more convenient access for passengers to the attractions in the city environment;
- allows easier and safer crossing of seaside boulevard since buses and remaining traffic are consolidated next to each other;
- a central island strip between bus and traffic lanes provides space for bus stops, allows to rest for pedestrians while crossing the boulevard and can be partially planted between stops and crossings.

The aim of the redesign of the coastal boulevard is to reduce its separation effect between the urban area and the seafront, regaining space for people instead of moving or parking vehicles and increasing the attractiveness of the major asset of Limassol for people to walk, linger, cycle, meet.

Improving road network capacity through ITS

Ministry of Transport, Communication & Works is currently preparing a procurement project for a substantial renewal of traffic controllers in the city of Limassol (renewing the legacy SCOOT system), which can be considered as a major prerequisite for the actual and smooth operation of the vehicle actuated traffic signalization system. Through this intervention the following actions will be offered:

- Optimizing traffic flows/minimizing delays at junction/arterial/network level;
- Collecting traffic data through detective loops in real time – create traffic profiles per road segment/type – get prepared for scenario-based strategies;
- Accommodate traffic variations within a typical day (inbound/outbound traffic);
- Get early warnings for network disruptions;
- Future possibilities for implementing complex operations (event management/evacuation plans);
- Enable deployment of other important ITS such as the bus priority, red light enforcement.

Interventions proposed for the five municipal authorities of the Greater Area of Limassol

The concept of extensive pedestrianisation proposed for the municipality of Limassol, has also to be applied to all other five municipalities, in order to be consistent with the concept of polycentric development for the target year 2030. The idea behind this is that residential growth will be focused in the various centres, however, these centres will also serve future work place development as well as developments of shopping and leisure facilities, resulting in short distances and reduced need to travel. This concept does not reduce the importance of the central municipality as the driving force for the future economic and social development of the metropolitan area.

Taking into account the need for regeneration of Municipalities' historic centres, the proposed by the Limassol SUMP bicycle and pedestrian networks, Public Transport level of services provided, public parking lots and the locations of Park and Ride Stations along Motorway (A1), the main proposals are focused in the following measures:

- Streets pedestrianisation;
- Converting roads in traffic calming streets;
- Modifying the position to build new parking spaces (due to the above proposals).

5.2 Public Transport

Amongst some others, the following key objectives of the SUMP Limassol were defined by the stakeholders

- The city needs a transport system, which will satisfy the increased travel demand
- Residents and visitors should adopt new behavioural models
- The city should adopt policies restricting the use of private vehicle
- The city should adopt solutions regarding the travel demand for work purposes (daily peaks)
- The city should adopt a mobility system accessible for specific target groups i.e. the elderly people and people with disabilities
- The city should focus on the infrastructure of sustainable transport modes

All of the above-mentioned objectives are comprehensively addressed by strengthening and improving the public transport system, aiming at significantly increasing the mode share of public transport (and the other environmentally friendly modes) thereby reducing private motorised transport.

5.2.1 Objectives of Public Transport Measures

The main objectives of the development of the proposed public transport system is to establish a reliable, convenient and fast alternative to private motorized transport. This means to enhance the connectivity between local potentials within the centres as well as between the centres. The proposed system helps, to improve the accessibility of potentials with high reliability and punctuality. At low costs and with high safety standards, passengers will be able to conveniently reach their destinations either with direct services or making use of optimized transfer options. This primarily helps to

- avoid unnecessary travel by motor vehicles, reducing noise and pollution, reducing environmental and social costs
- shift the trend of individual motorisation to safer, efficient and environmentally friendly transport modes, improving interconnectivity between public transport and walking/cycling
- improve infrastructure and management of transport services by adopting cleaner, efficient and safer technologies and practices.

Cyprus made a commitment to the EU to reduce CO_2 emissions by 24% until 2030 (compared to 2005). In order to reach this target, mode shares of 20% for public transport are envisaged. Taking into account the very low current shares of approximately 1.8%, a reasonable assumption is to reach 5% to 7% by 2025. However, in the light of the 10% PT share calculated for 2030 in this study, further efforts have to be made to reach the 20% target by 2040 latest.

5.2.2 Key Strategies

Public transport as mass transit is the most energy efficient form of travel and consequently helps to reduce emissions. Public transport uses rare urban space more efficient than private motorized traffic in both, space to travel and even more so: space for parking. Also, public transport plays an important social role, ensuring that all members of society are able to travel, not only those with driving license and car availability.

The general aim of public transport development in Limassol and the five municipalities, is to enhance the connectivity between local potentials within the centres as well as between the centres. The proposed system helps, to improve the accessibility of potentials with high reliability and punctuality. At low costs and with high safety standards, passengers will be able to conveniently reach their destinations either with direct services or making use of optimized transfer options.

The key strategies to effectively increase the mode share of public transport are:

- Implementation of hierarchical network system with primary, secondary and feeder lines
- Optimisation of line routes and simplification and consolidation of bus lines
- Comprehensive upgrade of operation hours and frequencies
- Integration of school bus lines in regular services where feasible
- Establishment of central bus terminal at Themistokleous street

- Hierarchical system of bus stops
  - Interchange bus stops
  - Multimodal transport hubs
  - Standard bus stops
- Park & Ride facilities
- Bus prioritisation measures (exclusive bus lanes)
- Appropriate vehicles
- Pre-Trip passenger information
- ITS and ticketing technology

5.2.3 Description of Measures

The developed measures can be categorised under the following main headings:

- Network Hierarchy: a hierarchical and integrated network of public transport lines was developed, consisting of
  - Level 1: Primary Bus Lines servicing main urban development axes of high demand by connecting Limassol's central business district with the sub-centres. Passenger demand on these lines is characterized as being "high" to "very high".
  - Level 2: Secondary Bus Lines complement the main bus network. They interconnect Limassol's sub-centres to each other and service main ring roads. The lines also provide basic public transport services for high density areas located away from Primary Bus Lines. Passenger demand on Secondary Bus Lines is classified as "medium" to "high".
  - Level 3: Feeder Lines complement Limassol's future bus network. They provide basic public transport service for all areas off the Primary/ Secondary Line Network, especially low-density areas in the suburbs. Passenger demand on Feeder Lines is rather low. The operational mode can be either a conventional bus service with stops at each bus stops along their route, or, if appropriate, an on-demand service (demand responsive = DR).
- Bus Route Network: the proposed bus route network is a simplification of the current network, consisting of radial primary lines, a circle and two radial lines as primary lines, several radial secondary lines all connecting at the Central Bus Terminal plus 16 feeder lines, mainly tangential lines connecting low density areas with primary and secondary line bus stops. The network structure is clear and simple. The central point is the Central Bus Terminal in the City Centre, serviced by most primary and secondary lines. Changing between lines is easy and coordinated with short waiting times at the CBT and at the designated interchange bus stops and multimodal hubs, mainly along the ring lines.
- Operation Hours and Frequencies: Operation times are generally extended on working days to the period between 05:30 am and 24:00 midnight, line 1 even until 01:30 am. Services on feeder lines normally ends at 22:00pm. Primary lines operate mainly at 10-minute headways, only in the very early hours, mid-afternoon and very late hours at 20-minute headways. Secondary lines operate mainly at 20-minute headways, increased to 10-minute headways within peak hours. Feeder lines operate generally at 20-minute headways or on demand. Services are reduced on Saturdays, Sundays and Public Holidays.
- School Bus Lines: the concept is to integrate school and university bus demand in the regular public transport network, providing services in appropriate walking distance and for the necessary services times for schools and University. Only three bus lines had to be designed to provide access to schools at remote locations. These bus lines have services at 20-minute headways during relevant school hours.
- Bus Terminals
  - Central Bus Terminal (CBT). The Central Bus Terminal (CBT) will be located at Andrea Themistokleous St./Anexartisias St. in Limassol's historic city centre. The CBT will be the terminus for 15 bus lines, the Central line, 7 primary lines, 7 secondary lines. These 15 lines will service the CBT at 10-minute headways; the CBT will allow passengers to transfer between two radial lines with a smooth one-stop-change with short waiting times.
  - Other Terminals and Depots: Multipurpose City Terminal will be located close to Leontiou street; depots for maintenance, overhauling and cleaning of vehicles will be located outside the city centre.

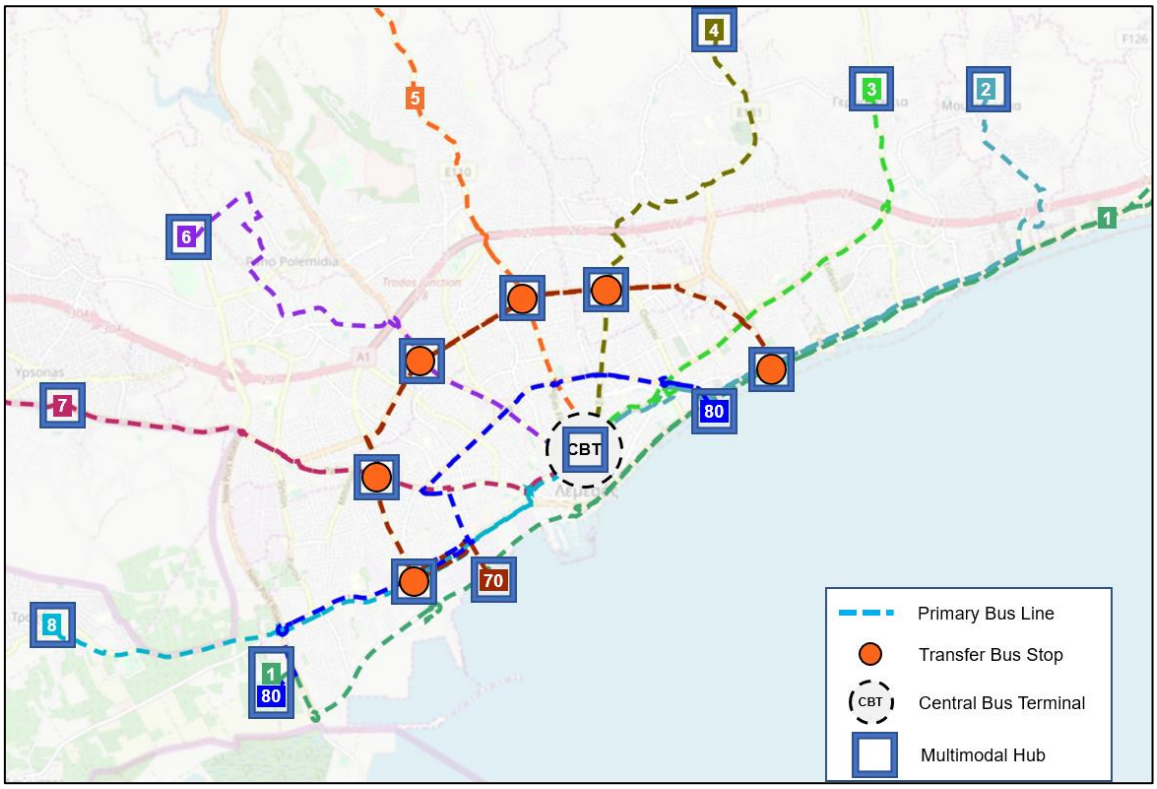


Figure 4: The network of Primary Bus Lines with Transfer Stops and Multimodal Hubs

- Bus Stops: location of bus stops will be optimised: an average distance of 600 to 800 m between two subsequent bus stops, i.e. an access distance for public transport users of 300 to 400 m at the maximum (shorter distance in the city centre, longer distance in the suburbs). Equipment at these bus stops will be improved including paved waiting space, elevated curbs for barrier-free vehicle access, tactile guiding system, bus shelter, lights, seats, waste bins, basic information on network and services, screen with real-time information on main stations; Additional interchange bus stops will located along ring line 70 with all intersecting radial primary lines. Multi-modal transport hubs will cater for access also by other modes.
- Park & Ride: 5 Park & Ride stations will be provided, mainly allowing long-distance car drivers to change to public transport for entering the Limassol city centre.
- Bus Prioritisation Measures: bus prioritisation consists of designated bus lanes along the major bus corridors and respective bus priority signals at the junctions
- Vehicles: minimum equipment and characteristics of the future bus fleet are defined.

5.3 Pedestrian Measures

Walking is the most natural as well as the most social form of mobility. It is available to almost everyone at any time, is free of charge, saves resources, does not cause emissions and requires comparatively little space. In addition, walking is good for your health.

The great importance and the clear advantages of pedestrian traffic are clearly disproportionate to the reality in Limassol. In most parts of the city's network, only leftover areas are designated to pedestrians in contrast to the sufficient or even generously dimensioned roadway space. A convenient and safe footway network with high amenity values is, with few exceptions, rarely found in Limassol city but also in most of the municipality centres. This is particularly worrisome in the light of demographic development, having an increasing share of active elderly population with potentially more disabilities.

The integrated pedestrian network plan aims to:

- Improvement of safe pedestrian infrastructure
  - Provide adequate and wide pedestrian pavements along all urban roads
  - Extend share of pedestrian areas

- Pedestrianisation of commercial streets
- Reduction of road capacities

5.3.1 Objectives of Pedestrian measures

The overall objective of this key aspect is to provide pedestrian infrastructure that can be used conveniently and independently by people with different resources and competencies. The share of walking as competing mode of transport needs to be increased significantly. Specific main targets for the concept were defined to be:

- High Technical and Social Safety standards: pedestrians are the most vulnerable road users, therefore conflicts with other road users need to be minimized, ideally by separating pedestrians from (mainly motorized) traffic. Appealing design, avoiding underpasses or bridges and lighting increase social safety and sense of security.
- Direct connections with minimized detours: walking is quite detour sensitive, therefore origins and destinations for pedestrians should be kept as short and direct as possible (e.g. with respect to crossing roads or intersections). Appropriate signposting helps to reduce searching and detours.
- Appropriate dimensioning: pedestrians need to be able to walk comfortably (possible even in pairs) without conflicts with other pedestrians, cyclists or other obstacles. This includes walking with buggies/walking frames/wheelchairs or with some luggage.
- Minimisation of obstacles: trees/tree pits, street furniture, high curbs are hindering all pedestrians and even more so affecting persons with limited mobility. Therefore, besides appropriate dimensioning, arrangement or if necessary, prevention of potential obstacles is crucial.
- Attractive design: appealing design makes walking not only socially safer but also more attractive as a competing mode for short-distance trips. Moreover, consistency of appealing design has a highly positive impact on both, short- and medium-distance trips.
- Requirements of persons with disabilities: apart from the physical accessibility, consistent design and appropriate guidance measures support traveling of persons with limited mobility also in context of interchange between walking and public transport.

5.3.2 Key Strategies

Walking is the most natural as well as the most social form of mobility. It is available to almost everyone at any time, is free of charge, saves resources, does not cause emissions and requires comparatively little space. In addition, walking is good for your health. Walking does not only serve to cover distances but also comprises aspects of communication and abidance in public streets and places.

It is of utmost importance, to provide pedestrian infrastructure that can be used conveniently and independently by people with different resources and competencies. The share of walking as competing mode of transport needs to be increased significantly.

The key strategies to enhance the extend, safety and quality of pedestrian infrastructure are:

- Adequate and wide pedestrian pavements along all urban roads
  - Sufficiently dimensioned and safe pedestrian infrastructure needs to be implemented successively along all relevant urban roads, convenient usability has to be guaranteed if necessary, with strict law enforcement
- Extension of pedestrian areas in Limassol and the Municipalities
  - The existing pedestrianised areas mainly in the city centre and the core areas of the 5 municipalities need to be extended, seamless and safe walking within the pedestrianised areas has to be guaranteed
- Pedestrianisation of commercial streets with high pedestrian traffic flows
  - Anexartisias street will be converted from a commercial two-way traffic street into a pedestrian zone with buses operating in one direction
- Administrative and policy measures
  - A number of measures to help creating, promoting and maintaining convenient pedestrian infrastructure aims to support the plan to get Limassol pedestrian friendly

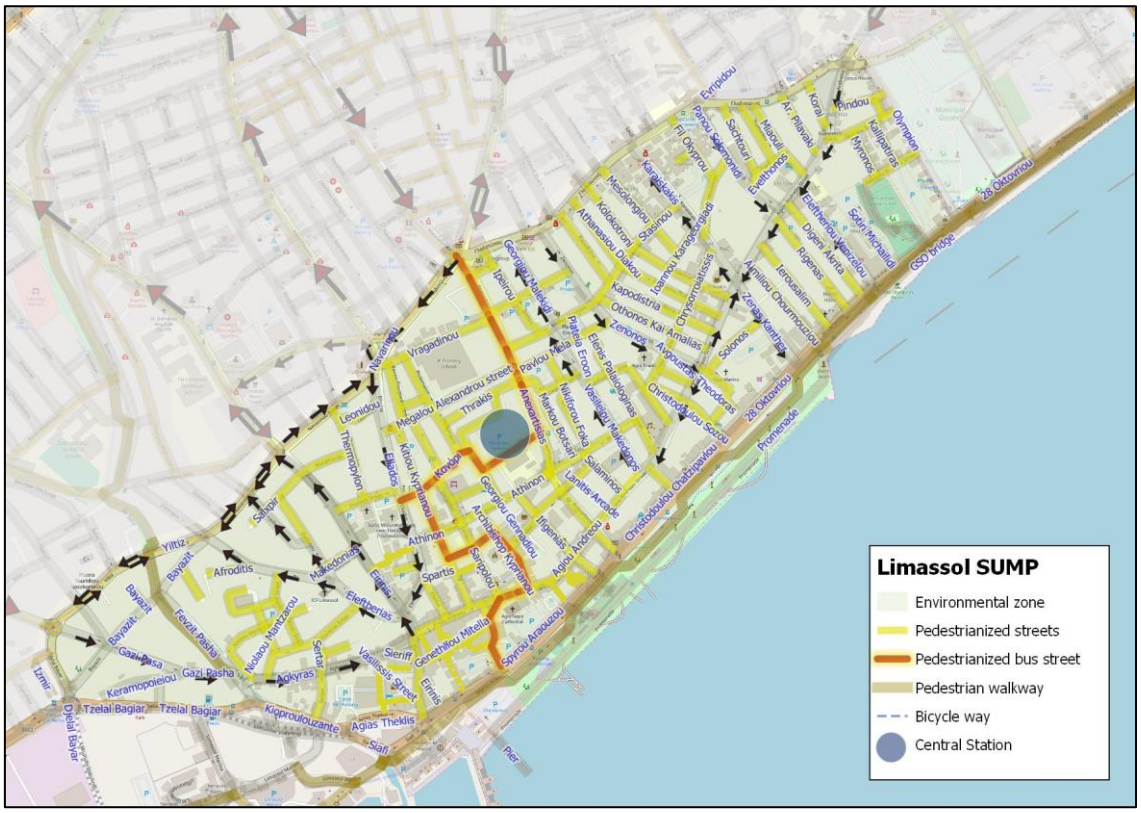


Figure 5: The proposed pedestrian area within the City Centre of Limassol

5.4 Cyclist Measures

All over Europe, cycling is becoming more and more popular with respect to recreational and sportive activity but also as a convenient mode of transport for serving every-day trips such as commuting.

- Cycling is healthy, improves fitness and reduces stress
- Cycling is a low-priced mode of transport with respect to purchasing a bike and operational costs
- Cycling is faster on short and medium distances compared to public transport and even the private car
- Cycling serves climate and environmental protection, it does not consume fossil energy and is emission free
- Cycling relieves roads, reduces congestion and has lower demand for parking space
- Cycling supports local trade and inner cities since cyclists' shop rather close to their homes
- Cycling means reduced costs for the city (e.g. less investment into road infrastructure despite growing population)

5.4.1 Objectives of Cycling measures

The objective of the cycling measures concept is to provide a framework for the promotion of everyday, as well as recreational/tourist, cycling. This should help to significantly increase the importance and consequently, the modal share of cycling.

The key targets are:

- To improve the quality of connectivity between the quarters' and/or municipalities', which could attract people to choose the bicycle for medium-type distances.
- To improve the accessibility of social, educational, administrative, commercial, cultural attractions for all person groups.
- To improve interconnectivity with other sustainable modes of transport.
- Establishing cycling as an independent and safe mobility mode for children and youngsters.

- For people who are economically disadvantaged or do not drive cars, being able to cycle safely facilitates their search for work, access to services and also to retain social connections.
- To improve traffic safety for cyclists and other road users.
- The promotion and support of cycling helps to reduce motorised traffic and in turn improves quality of life by reducing emissions of pollutants and noise specifically in central, densely populated and used areas.

5.4.2 Key Strategies

For bicycle riders, cycling as a low-priced mode of transport is healthy, improves fitness and reduces stress. Specifically in cities, it can be faster on short and medium distances compared to Public Transport and private cars. For the society, cycling serves climate and environmental protection, does not consume fossil energy and is emission free. It significantly reduces congestion and demand for parking space and consequently means reduced costs for the city. For the local economy, it supports local trade and increases accessibility.

The proposed concept aims provide a framework for the promotion of everyday, as well as recreational/tourist, cycling. This should help to significantly increase the importance and consequently, the modal share of cycling.

The key strategies in detail are:

- Development of a coherent, comprehensive and safe bicycle network
  - Implementation of sufficiently dimensioned cycle lanes along all major roads
  - Separate cycle tracks where road space is not sufficient for cycle lanes
  - Dedicated cycle tracks for combined every-day and sportive/leisure cycling
- Associated Bicycle infrastructure
  - Supplementing infrastructure for bicycle parking at or near relevant locations (potentials) such as schools, university, cultural, touristic or retail facilities, public administration
  - Establishment of regulations and guidelines to provide appropriate infrastructure
- Bicycle renting systems
  - Enhancement of current rental systems, implementation of e-bike rental schemes
- Associated administrative and policy measures
  - Creation and provision of adequate infrastructure for cycling and supplementing infrastructure
  - Adoption of cycling requirements into Local Plan
  - Provision of land for cycling infrastructure
  - Promotion of cycling with regards to commuter (including education) cycling, provision of incentives
  - Promotion and support of bicycle rental operators and facilities

5.4.3 Description of Measures

The approach for cycling follows the assumption: Build cycling infrastructure and the number of people cycling will increase. Consequently, the Consultants propose a **coherent, comprehensive and safe bicycle network** based on design criteria and standards.

The bicycle network comprises of

- Bicycle lanes along all major corridors (LLP - first and second priority axes);
- Bicycle only roads for fast bicycle connections (LLP along streams/ rivers) - "greening urban arterials" and
- Safe and weather protected bicycle stands at all major destinations.

The Consultants promote segregated (also referred to as designated) bicycle infrastructure, namely cycle lanes on roads, in contrast to separated cycle ways (or ‘cycle tracks’) usually hidden behind parked cars or other obstacles, often sharing the available space with pedestrians (footways). In the Final SUMP Report, the Consultants illustrate different road cycle facilities, including cross sections.

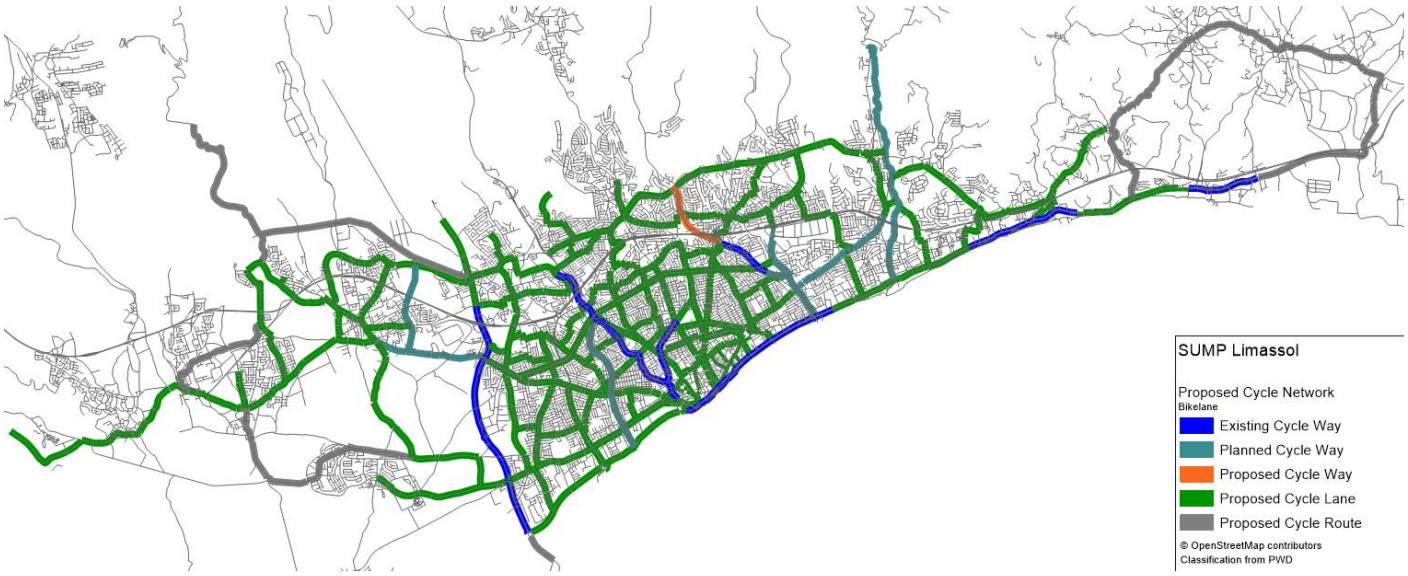


Figure 6: The proposed bicycle network in Limassol

The cycle network was developed to improve the local connectivity between quarters, between Limassol city centre and municipalities as well as between the municipalities. Moreover, the focus was on the local accessibility of social, educational, administrative, commercial and cultural attractions

In the proposed bicycle network, all municipalities concerned are well connected by cycle infrastructure to the city centre of Limassol as well as between each other. In most cases, the route can be selected between rather direct connections mainly on cycle lanes along the major roads or alternative routes such as the cycle tracks or cycle lanes on minor roads. Moreover, well signposted cycle routes will form the basis for trips to tourist destinations from the Limassol city centre, from the tourist areas in the North-East as well as from the municipalities. At the city and municipalities level, the dense network will provide access to and interconnectivity for cyclists between the major destinations, including schools.

Taking into account that most of the streets in the environmental zone are pedestrianised and open for bicycles in the Limassol city centre, a very dense network allows for riding bicycles safely almost anywhere.

5.5 Parking

5.5.1 Objectives of this area of intervention

Mobility is widely acknowledged as a public good that according to sustainability principles, is to be protected not by allowing people to extend the use of their private cars but rather by providing them the necessary options to use Public Transport and the active modes (walking and cycling). To the other end, high parking availability, not to mention free parking supply, is obviously against these principles and should be managed in such a way that in the time frame of the SUMP implementation (2019-2030) is fully controlled and rationalized.

Parking supply is in general terms the trigger for a driver to make his/her final decision on how long and how close their car is parked in relation to their final destination. To this equation we now have to add high quality alternatives with Public Transport, walking and cycling.

Taking into account the strong car dependency of Cyprus, this task is obviously not an easy one and has to be gradually implemented and well defined. As any other regulatory framework cannot be achieved - at least in its first implementation steps - without effective enforcement that will be enhanced and supported by innovative ITS solutions proposed for implementation in the relevant ITS supporting systems described herewith.

To this end the Limassol SUMP suggests an integrated parking policy structure with separate divisions for residential parking permit administration and on street design and enforcement. The basic principles of the proposed parking policy for Limassol are the following:

- Residential parking for those already living in the central areas of Limassol, ensuring at least one (1) parking space per household
- Reserved parking spaces for the Disabled and other special categories of users (e.g. banks, public authorities etc.)
- Adequate parking space for loading/unloading for retail stores, restaurants etc.
- Paid on-street parking spots for the public, that should be adequately priced in the years to come, to allow gradual abandonment of the private car
- Paid off-street parking spots which should be rational and fully controlled, taking into account that off-street parking impact is permanent and costly
- Finding a balance between well-defined legal parking options and effective enforcement is a crucial objective. Returning a share of these revenues to the local community can/will raise social acceptance levels
- Land Use policies such as the minimum parking requirements have a strong impact on parking supply and should be re-thought and re-designed in order to achieve sustainability objectives
- Public Transport operations such as Park & Ride as well as specific incentives for enabling modal shift and high-quality services, are deemed essential and should be closely co-ordinated in a central manner.

5.5.2 Key strategies

The figure here below describes the proposed structure for implementing a sustainable parking policy for Limassol. In detail, each key strategy is presented in the Final SUMP Report.

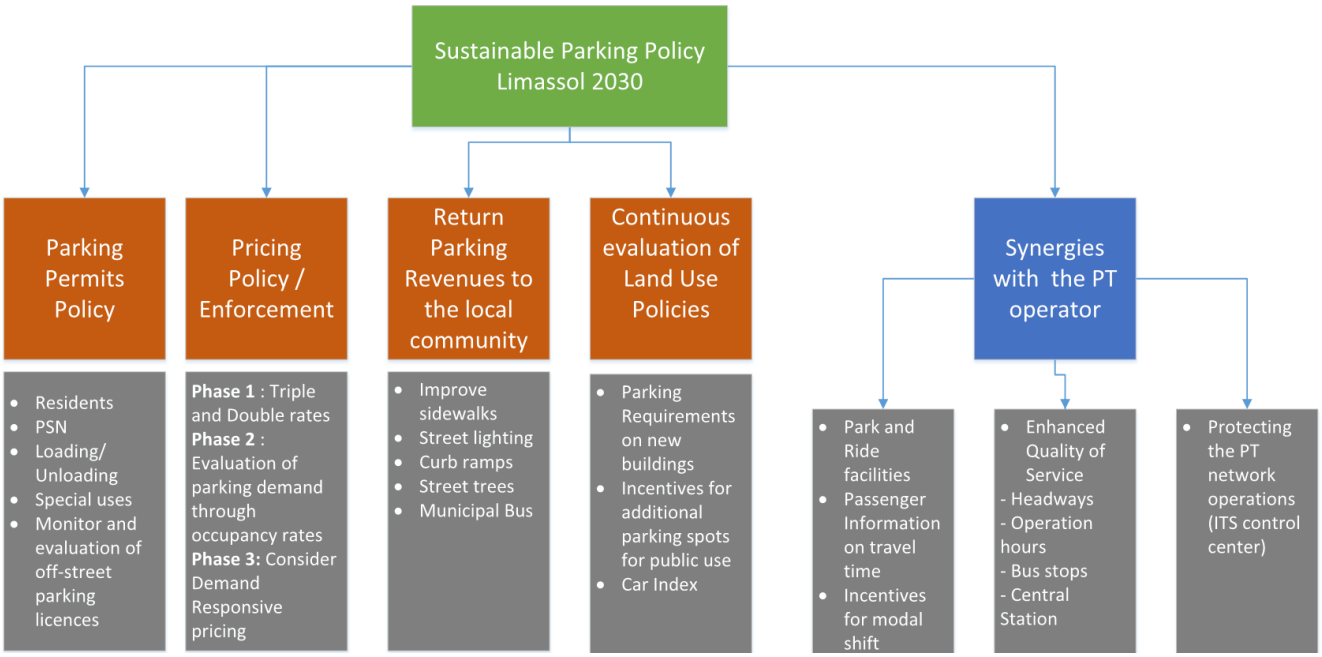


Figure 7: Sustainable Parking Policy for Limassol 2030

5.5.3 Description of Measures

The parking policy implementation area corresponds to this segment of the city centre surrounded by the streets of Omonoias Av. – Roosvelt - Dimokratias – Makariou III and the seafront. Taking into account the specific characteristics of this central area, current and future estimated parking balance and the policies applied by SUMP, five (5) parking policy zones are proposed with respective general parking strategy proposals, as summarized hereinafter in the following map.

It is very important to point out that, from a policy perspective, parking deficit does not necessarily mean that policy measures should satisfy the remaining parking demand, because this consideration is not in line with the sustainability objectives of a smart modern city that is prepared to address the future mobility challenges in the most environmental, social and economic way. More precisely, the solution lies mostly in convincing more people to use Public Transport and active transport modes through high level mobility services, top quality infrastructure and efficient reallocation of public space. Indeed, the extended pedestrianisation of the central area serves such a purpose, but a holistic parking policy should also adopt mitigation measures in favour of affected users.

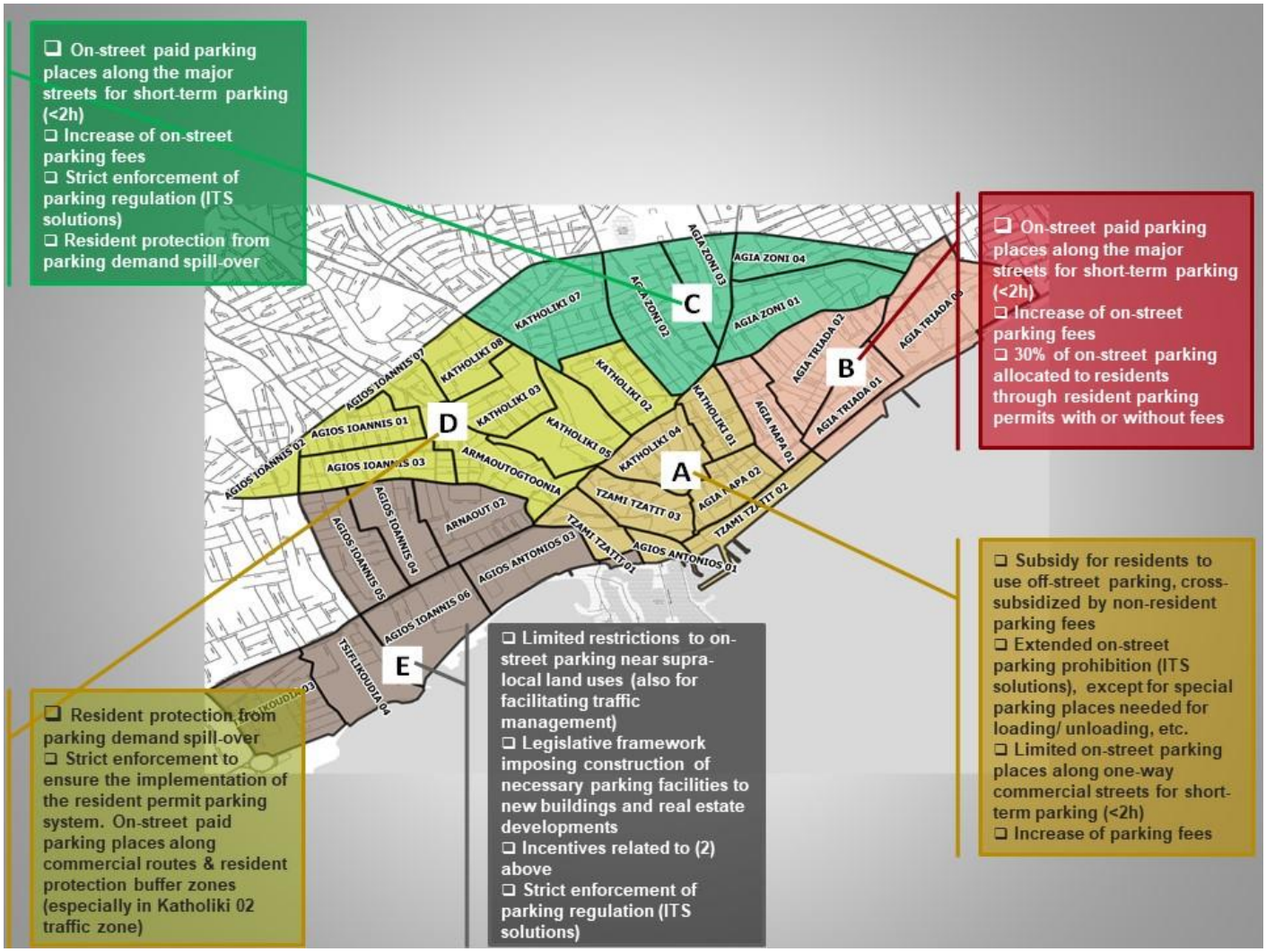


Figure 8: Parking Policy Zones and general Parking Strategy Proposals

5.6 Freight logistics

The city of Limassol is a place of great concentration of economic and social activities with logistics being of highest importance for the sustainability and the economy of the city but also the entire region. With the goal to optimize city logistics while preserving the environment and increasing the attractiveness of the city, various measures have to be taken.

Apart from general measures affecting also freight transport, no specific urban logistic related interventions were included in the scenario development. This is mainly due to the lack of detailed input data that would be required in order to generate a dedicated freight model, reflecting realistic transport movements. Nevertheless, interventions such as new roads and road upgrades on the one hand, speed and capacity reductions and even road blockings on the other hand do have an even more severe impact on LGV and even more so on HGV traffic.

The key issues identified for the SUMP Limassol logistics section are:

- The city logistics with respect to the central city area
- The heavy freight traffic caused by the Limassol port's commercial activities

5.6.1 Objectives of Freight Logistics

The most severe problems caused or significantly aggravated by urban commercial traffic are:

- Traffic flow/congestion issues caused by large traffic volumes, traffic incidents, inadequate driver behaviour
- Noise and pollutant emissions
- Issues resulting from parking and loading/unloading

Consequently, the main targets of an urban freight logistics concept have to be

1. Minimising the number of vehicle trips by optimizing urban freight transport
   - With optimal routes
   - Consolidated efficient loading
2. Minimising the impact of the traffic
   - Zero or low emission vehicles of appropriate size
   - Delivery/removal time slots
3. Minimising the impact of parking, loading/unloading
   - Clearly signed, dedicated loading bays, parking infrastructure
   - Law enforcement to prevent illegal parking, loading/unloading behaviour

5.6.2 Key Strategies

The city of Limassol is a place of great concentration of economic and social activities with logistics being of highest importance for the sustainability and the economy of the city but also the entire region. The current logistics system is not based on an integrated concept; therefore, urban logistics is inefficient and causes various negative impacts.

The proposed concept aims to reduce negative impacts, namely congestion in urban environments, noise and pollutant emission

The key strategies in detail are:

- Optimising routes of commercial/freight traffic outside the environmental zone
  - To consolidate trips of commercial traffic, signposted routes serve to direct the vehicles on optimal routes to their destinations
  - Destinations are both, gates to the environmental zone as well as final destinations
- Minimising the impact of commercial traffic generally in environmental zone particularly
  - Access restrictions: no commercial traffic allowed in sensitive areas at all, access from alternative streets only
  - Vehicle restrictions: appropriate size and high environmental standards allowed only
  - Time restrictions: time slots for delivery and removal trips
  - Incentives for consolidation of delivery trips to reduce number of trips
- Minimising impact of parking, loading and unloading
  - Dedicated loading bays for commercial vehicles
  - Clearly signed and specified restrictions and provisions for loading/unloading
  - Designated parking places for commercial vehicles
- Strict law enforcement to prevent illegal parking, loading/unloading
- Optimising port traffic
  - Incentives and regulations to consolidate trips from and to the port of Limassol
  - Optimising routes to/from port by signposting dedicated routes (e.g. between port and motorway A1)
  - Implementation of heavy vehicle restrictions on routes that are currently used as shortcuts

5.6.3 Description of Measures

The Consultants focus on measures to **reduce the freight traffic volumes**. It is important to ensure unavoidable trips to be as short and direct as possible and to avoid detours and search traffic. For this purpose, a clear signposting is crucial, to warn the drivers when roads are inappropriate for their vehicle (e.g. narrow alleys), inform about regulations on roads (e.g. vehicle weight, time restrictions) and parking/loading regulations. For freight transit traffic, one measure is to sign advisory or statutory truck routes mainly for heavy freight traffic. For the Limassol Environmental Zone and for the Buffer Zones, a one-way road scheme is proposed to service the areas. For the urban freight traffic and particularly for the heavy freight vehicles, proper signposting is required to lead the traffic to the respective entrance points.

To **reduce the impacts of freight traffic** in certain areas, regulations with respect to vehicle restrictions can be imposed to prevent vehicles of a certain weight and/or length to use particular streets. Time regulations can be used to control urban freight transport, but also private road vehicles. In some areas of Limassol city, this is already the case. Access to pedestrianised areas will be allowed for vehicles with special permits only. Another option suggested for the city of Limassol is the support of Environmentally Friendly Vehicles (EFVs), for example by providing charging stations free of cost or at reduced cost. Additionally, providing dedicated space for parking EFVs near the city's area of operation could facilitate the promotion of environmentally friendly logistics. Finally, the cargo bikes (with or without electric support) are an environmentally friendly alternative. Specifically, in the pedestrian zones, they can be used without restrictions for delivery of small loads or parcels. Combined with stationary boxes at appropriate places next to the permitted road network, they can serve to reduce the amount weight of the load and allow for multiple tours through the pedestrianised streets. Taking into account the nature and increasing importance of delivery trips with smaller consignments, this approach can help to significantly reduce the overall impact of urban freight transport.

For the Limassol Environmental as well as for the Buffer Zone, a parking scheme for all private and commercial traffic is proposed. In combination with the pedestrianised areas, parking is permitted only on designated parking areas which are liable to pay costs. In order to guarantee necessary deliveries of goods and services, loading bays and waiting areas need to be provided. Particularly this holds true for one-way streets and most importantly for those served by bus lines. Here illegally parked vehicles would severely hinder the bus operation and in turn all other traffic. Law enforcement is needed to exact the regulations.

Finally, there is a need for consolidating freight traffic (but potentially also coaches) to and from the **Limassol port**. One measure is a clear signage of the proposed lorry routes to and from the port in combination with restrictions on Omonoias road (closed for trucks of a length exceeding 15 metres with exception of local delivery). Another measure includes the implementation of heavy vehicle restrictions on routes that are currently used as shortcuts.

5.7 Traffic Safety

Road safety is an integrated system of infrastructure, infrastructure components, rules and regulations, behaviour and attitudes of road users, moving vehicles, cyclists and pedestrians, individual behaviour of drivers and other road users. Road safety obviously has a major impact on those who are directly affected by an accident, but it also impacts on the perception of the transport system, the possibilities to use the public road space for different activities ranging from moving with motorized vehicles, cycling, walking, lingering. Consequently, it affects the freedom of people and particularly of the younger generation to use the road space or to being allowed by their parents to use it.

5.7.1 Objectives of Traffic Safety

Road and traffic safety strategy as part of the SUMP aims to mitigate the risks for all road users. Therefore road safety measures are chosen to reduce the number of accidents as well as the number of injuries and fatalities on the roads of Limassol. The goal is to create safe infrastructure for all road users, especially improving the situation for pedestrians and cyclists. All road users should have a feeling and perception of safety on Limassol's road network. A safe road network which considers the needs of all road users and furthers non-motorized and public modes of transport is required to enable the mobility of all generations, especially younger ones.

5.7.2 Key Strategies

A road network safety analysis, a specific road safety inspection and an Accident Accumulation Zone analysis were conducted for the SUMP Limassol. The analyses revealed serious issues concerning road safety in a wide range of aspects from parking, to marking and signage, lighting, cycling and pedestrian infrastructure, lane widths and multi-lane roundabouts.

The aim of traffic safety proposal is to mitigate the risks for all road users.

The key strategies are:

- Safe pedestrian crossings using (physical/raised) road median as crossing-aids to increase safety for crossing pedestrians and block vehicles from overtaking (e.g. stopping buses)
- Separated/protected right turning signal phase as standard to reduce risk of head-on collision, improve safety of crossing pedestrians
- Pedestrian signals with sufficient green-times at all signalised junctions
- Improvement of visual contact/reduce sight obstructions, enforcement of organised safe parking
- Road network classification under safety aspects considering flow and access functions
- Reduce number of lanes to reduce speeds and minimize overtaking manoeuvres, shorten turning lanes
- Improve equipment for handicapped people (e.g. acoustic signals during green time)
- Crossings aids at public bus stops to allow for safe crossing and reduce risk of vehicles overtaking stopping buses

5.7.3 Description of Measures

Several schemes are proposed for **traffic calming**. Besides some one-way streets, the environmental zone is fully pedestrianised (see Figure 5). In the buffer zone and the home zone, one-way schemes and other measures are proposed to complement traffic calming outside the Environmental zone.

For **Road Accident Accumulation Zones** (RAAZ) in Limassol, the Consultants propose a series of mainly mitigation measures within the Final SUMP Report. In general, Accident Accumulation Zones (AAZ) are areas where accidents repeatedly occur. Often local features of the traffic situation, mainly the infrastructure, contribute to such accidents taking place. RAAZ are areas in the road network with a minor spatial extent, at which a defined limit of number of accidents is reached or exceeded. AAZ can be traced at curves, junctions or intersections. The Accident Accumulation Zone analysis of the provided accidents from 2013 - 2016 revealed 12 RAAZ in the city of Limassol.

5.8 Needs of specific groups

Although the focus is on the accessibility of all groups and users to public space, special attention is given to certain groups. Given their mobility limitations in physical, social and financial aspects and well as the higher vulnerability of certain groups, those specific groups are blind persons, visually impaired persons, wheelchair users, persons with mobility disabilities, elderly, children, youth and students, people with low income.

5.8.1 Objectives

The overall objectives for improving the mobility of persons with permanent and temporary mobility limitations are social inclusion and accessibility. Both aim at ensuring that all citizens are offered transport options that enable access to key destinations and services – equal and free choice of transport modes as well as accessibility to public space for all groups and users. Improved accessibility is made possible by:

1. Easy and quick access to all the city's land uses (alternative transport modes, travel time reduction, reduction of congestion)
2. Respect for all citizens' particularities and equal provision of free and accessible space (infrastructure facilities for disabled people, ramps, sufficient pedestrian width for strolling, infrastructure for blind and deaf persons, etc.)
3. Enhancement of the Public Transport system services (creation of a central station, regional terminals and P&R stations, network coverage, scheduling, special services for people with disabilities, etc.)
4. Development of a Public Transport system on Demand and increase of densities to support the public transport demand
5. More equitable distribution of road capacity to all users. Obviation of the phenomenon "road boundary" - "urban ravine"
6. Unobstructed access to the coastal front
7. Intersections' and gateways' management, multimodal connections' development and creation of routes vertical to the coastal front

5.8.2 Key strategies

For persons with disabilities to be able to move freely and self-determined, all efforts and measures undertaken in public transport, pedestrianisation, parking, traffic and road safety are necessary but not sufficient conditions.

It is necessary to develop a public transport system both in time (service times and frequencies) as well as in space (bus stops and hubs in the central areas and at the destinations not just close to them). Furthermore, it is mandatory to have coherent access to, in and from the public transport and its means/vehicles. The same applies to pedestrian measures. For persons with disabilities as well as for the visually impaired, elderly and children, it is also necessary to improve the pedestrian infrastructure by providing adequate and wide pedestrian pavements as well as a coherent, coherent pedestrian network connecting homes, shops, work, leisure, medical and other facilities. Following and implementing a coherent "Design for all" concept in new and already existing built environment, removing obstacles and providing clear orientation, both visual as well as tactical, are mandatory steps to make public space accessible, convenient and barrier free. With respect to measures directly and indirectly related to special needs groups, the key measures are:

- Improvement of the layout/structure of the Public Transport network
- 3 Public Transport network levels - Primary bus lines, Secondary bus lines, Feeder/On Demand Services (geographic coverage - density of bus lines)
- Upgrade of the Public Transport services
- Extending operation hours
- Increasing frequency on primary lines, secondary lines as well as feeders
- Vehicle characteristics/acceptable service levels (improved & very modern bus fleet: low floor, air conditioning, etc.) accessible to persons with disabilities
- Increase the number of accessible points of interest for disabled people
- Concerns particular points of interest, such as the CBD area, municipalities and communities as well as shopping centres, university, hospital, stadium, social insurances services
- Creation of accessible routes linking the points of interest of disabled/Provisions around the points of interest of disabled (within a radius of 100 meters) based on design criteria and standards
- Increase the number of "safe pedestrians' & cyclists' crossing" along pedestrian and cycling ways network
- For all cross-section points of the particular networks to the main road network
- Development of a safe pedestrian infrastructure
- Closure of selected areas to motorised traffic (pedestrianisation - only for pedestrian/bicycle use and/or Public Transport) - "environmental zones"
- Balanced allocation of road network to cars & pedestrians - "calming areas"
- Adoption of low speed limits (<30kmph) - "home zones"
- Increase the "safe buffers" around primary schools
- Secure a safe buffer with a radius of approximately 50 m around all primary schools

5.8.3 Description of Measures

The measures for improving the **public transport** include the extension of the operation times as well as the geographical coverage of public transport services. Thus, public transport helps increasing the mobility of persons with disabilities as well as elderly, children and pregnant women who do not have the possibility to use a car and depend on good public transport or other persons to move them around. The consultants also recommend improving public transport vehicles as well as the infrastructure at the same time. The bus fleet needs to be replaced with low-floor buses, have a gradient to the side of the entrance and a ramp drawn to meet the sidewalk or the ground as well as suitable space to transport two-wheel chairs, wheeled walkers/rollators and/or baby cart. Making the public transport infrastructure more accessible to persons with mobility limitations also has to go hand in hand with making a journey with public transport as convenient and comfortable as possible. This includes pleasant waiting areas with possibilities to sit and rest on seating arrangements. Bus stops should be designed in such a way that people are able to choose between sunny and shady places as well as being wind-sheltered when wind is blowing.

Improving and enhancing the **accessibility for disabled persons** is best achieved by implementing integrated, coherent, barrier-free and coherent access chains thus providing access to and connectivity between major destinations as well as to locations of daily activities around home, work and leisure activities. Those chains are based on an accessibility network which includes pedestrianised streets and connects also public transport facilities and car parking (as it is illustrated in Figure 9).

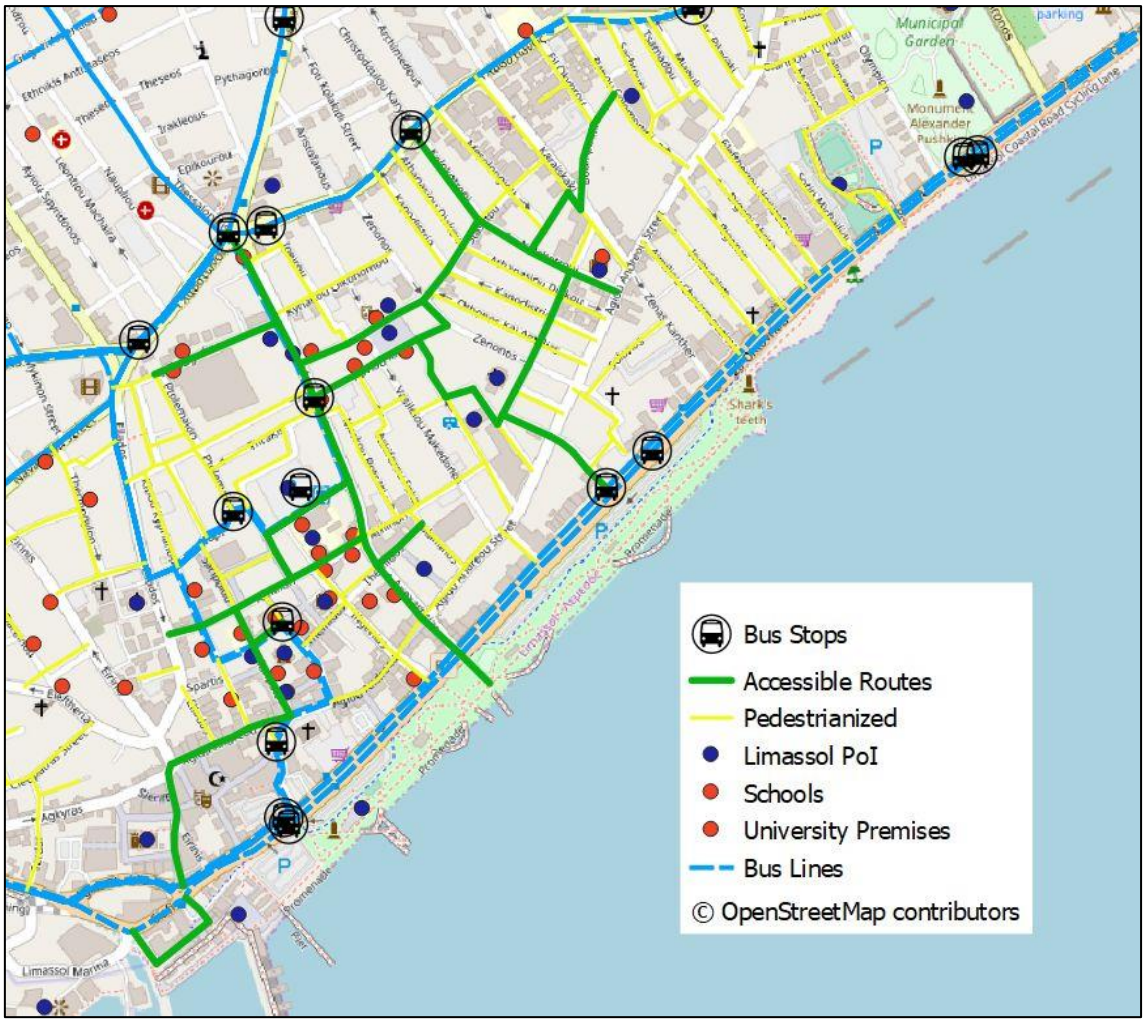


Figure 9: Accessibility Routes in Limassol City Centre

The accessibility network will be (i) designed without any stairs or curbs to be suitable for wheelchairs, walking frames; (ii) signed with tactile pavers for visually impaired persons; (iii) provide clear orientation with tactile pavers on the footway and visual design (combining contrast, brightness, colour and shape of materials used in the built environment) and (iv) offer digital information systems at crucial points (including tourist sightseeing spots) conveying information visually and audibly.

A specific measure for the needs of primary-school pupils concerns the implementation of **safe buffers** around primary schools. The ways to the schools have to be made safe and adequate to the needs of children of ages 5 to 12 years old. Where feasible, the most efficient way to achieve this is through pedestrianisation around primary schools within a 100-meter buffer zone. Although it is only a minimum requirement which does not fully reflect the needs for children to move safely by bike or to walk to school, it is a start. In cases it might not be possible to pedestrianize street segments, alternatives are “No Parking areas”, called and signed as “Drop-off and Pick-up Zone”, “Kiss and Ride Zone”, or “Kiss and Drop Zones”. Those zones are meant to prevent congestion including parking in second row in close vicinity to the school and its entrance. They rather provide a safe location for parents to drop off and pick up their children by car. The drivers always remain in the vehicles while the children get in or get out of the vehicle on the far side of the lane. Thus, those zones are a means to avoid dangerous traffic situations in front of schools as it is mostly the parents and carers who abruptly stop, do U-turns or other dangerous turning manoeuvres, impede other road users and in addition, drive too fast in front of schools.

5.9 Intelligent Transport Systems – ITS

Smart city can be considered as a long-term vision of an enhanced urban area aiming at reducing its environmental footprint and at creating conditions for better quality of life. It can be perceived as a cost-effective strategy to cope with severe urban problems such as traffic, pollution, energy consumption and waste treatment. It is part of Limassol's vision to promote innovation through the smart city concept, in order to become a place where traditional networks and services are made more efficient with the use of digital and telecommunication technologies for the benefit of its inhabitants and commercial activity.

A smart city goes beyond the use of information and communication technologies (ICT) for improved resource use and fewer emissions. It means smarter urban transport networks, upgraded water supply and waste disposal facilities and more efficient ways to light and heat buildings. It also involves a more interactive and responsive city administration, safer public spaces and meeting the needs of an ageing population.

Smart mobility is largely dependent on the technological sector, i.e. infrastructure and communication technology, intelligent transportation systems. The most frequently met smart mobility objectives are:

- reducing air and noise pollution
- reducing traffic congestion
- increasing peoples' safety

Smart mobility should be considered as a complex combination of projects and actions with different goals, contents and technological intensity. This chapter should be considered as a comprehensive road map for selecting and combining such ITS projects, based on legacy systems and maturity of telecommunication networks already in place always taking into consideration time plan and budget constraints may be applied in funding such activities in a still unstable financial environment in South East Europe and Cyprus.

5.9.1 Objectives of this Area of Intervention

Intelligent Transportation Systems (ITS) are considered as effective means to support the achievement of urban mobility goals. ITS are viewed as a set of tools assisting into the introduction of various transportation planning/management measures and actions.

Clearly, the deployment of ITS is much more complex within an urban environment since there are many inter-related urban transportation functions carried out by different actors. The cooperation of different actors is a prerequisite for successful implementation and operation of ITS within the city in order to support effectively the urban mobility system. In parallel, integration and interoperability among different systems and transportation modes is considered as a significant ITS aim in order to support integrated transportation services within the city, promote inter-modality and assist to travellers' information needs.

The main objectives of this area of intervention is to define the suitable ITS measures/interventions in order to serve as an effective tool the specific policies and measures defined within the Sustainable Urban Mobility of Limassol in different areas such as:

- Traffic Management within the city centre.
- Public transport operation.
- Parking management.
- Road safety.
- Freight logistics.
- Cycling.
- Pedestrian.
- Specific group needs.

Based on a comprehensively methodology, the ITS high-effectiveness measures/interventions are identified in order to serve high level objectives, operation objectives and the specific measures of the pre-mentioned areas of Limassol SUMP.

So, ITS measures/interventions have been addressed by examining horizontally all relevant measured defined within the Limassol SUMP.

5.9.2 Key Strategies

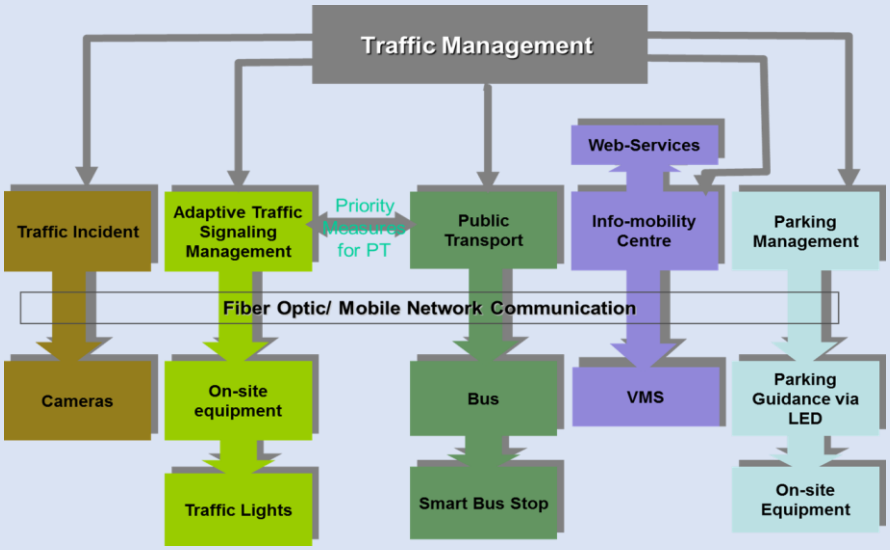
As mentioned previously, the defined ITS measures address horizontally the various SUMP policies and measures. The key ITS strategies for Limassol Area are summarized below:

Intelligent Transportation Systems (ITS) should be implemented in Limassol by taking into account the existing systems in operation as well as strategies, policies and measures to be implemented in order to develop a more sustainable transportation and urban development.

The introduction of ITS is as part of the Limassol Sustainable Urban Mobility Plan (SUMP) since ITS are considered as cost-effective measures and tools in order to support various Limassol SUMP measures in the areas of public transport management and operation, traffic management, road safety, parking management, freight logistics, cycling, pedestrian and specific group needs.

The key ITS strategies to support the SUMP Limassol implementation measures are described below:

- **Integrated Traffic Management Control Centre Operation**. All ITS city related applications (existing and future) should be centrally managed and in coordinated manner with the participation of all key city transportation actors.



- **Traffic Management & Control**. The introduction of ITS applications for the improvement of traffic conditions and congestion as well as the enhancement of the efficiency of transportation actors in relation to the receipt of traffic management actions/measures in real-time or semi-real-time fashion for both private and public transport operation.
- **Local Travel & Traffic Information Systems**. The introduction of multi-modal ITS applications for the enhancement of travellers' information both pre-trip and on-trip in order to gain travel time savings for the users and to improve the balance between transportation/parking demand and supply.
- **Safety & Emergency Systems**. The introduction of ITS applications for the enhancement of passengers' and drivers' safety either for pro-active purposes or improved incident reaction management and corresponding times.
- **Integrated Ticketing & Mobility Services**. The introduction of modern payment mechanisms to improve transport operators' efficiency as well as to improve the demand balance between the various transportation modes.
- **Enforcement**. The introduction of ITS applications for improving the enforcement of transportation measures such as the use of bus lane, speed limits and to reduce illegal driving such as crossing red light intersections.

The ITS interventions proposed for Limassol are divided into three categories, Road Traffic, Public Transport and Smart City related, briefly explained in the following table (a detailed description of all systems can be found in D14)

	Intervention	Description
ROAD TRAFFIC ITS	Urban UTC System	Traffic Signalization System upgrade (SCOOT)
	Traffic Detection field equipment	A wide array of traffic detection sensors to collect traffic data on a permanent basis
	Variable Message Signs (VMS)	Driver Information Systems
	CCTV surveillance cameras	Cameras for validating traffic conditions
	Incident detection systems	Field cameras detecting traffic irregularities (machine vision)
PUBLIC TRANSPORT ITS	Bus Priority System	Software and Hardware equipment allowing bus priority at selected traffic signalized intersections
	Dynamic Bus information Displays	Passenger Information Displays at terminals and bus stops
	Bus Lane Enforcement System	Enforcement cameras along exclusive bus lanes
SMART CITY APPLICATIONS	Integrated Parking Guidance System	Dynamic driver information displays for available off-street parking locations around CBD area
	Advanced Parking Payment Management System	A field sensor-based solution for managing on-street payment
	Centre to Centre communication between Traffic Systems	Software interfacing between remote traffic systems

Table 2: ITS interventions proposed for Limassol

5.10 Strategic Plans and Policies

The success of a sustainable mobility plan depends strongly on the coordination and integration of the transport and land-use policies in a study area. In the case of the Limassol SUMP the preferred policy Scenario chosen in order to achieve the vision and objectives of the SUMP is Scenario 6, which has been described in deliverable D8.1. Scenario 6 consists of a set of transport mobility strategies and an urban policy strategy based on the polycentric and mixed land use development pattern. This chapter evaluates the existing development plans of the study area and analyses the proposed policies of the polycentric land-use development of Scenario 6.

Figure 10: Planning Strategy Objectives

The proposed land-use strategy tackles the existing challenges of the Local Development Framework and mitigates against the negative mobility trends taking place in Limassol. The recommended land-use policy package, complements and adds value to the transport interventions proposed by the SUMP and plays a key role in achieving the desired objectives.

5.10.1 Objectives

The polycentric land-use scenario follows the principles of sustainability endorsed by the Limassol SUMP. These principles aim at promoting multi-modal transportation and improving the quality of life of citizens. The general scope of the proposed land-use strategy is the creation of a liveable, safe and inclusive built environment for the citizens of Limassol. The specific objective of the strategy is the enhancement of the peri-urban centres while

maintaining and strengthening the pivotal role of the City Centre. The strategy also aims at attracting investment so that the city remains competitive nationally and internationally.

The Figure 10 above illustrates the general the objectives of the proposed planning strategy.

5.10.2 Key Strategy Policies

The proposed Strategy is divided into four policies, with each policy acting as complementary to each other. The proposed main policies aim at ensuring that the mobility policies proposed by SUMP are reflected in the urban form and land use of the Greater Limassol Urban Area.

The policy package is summarised and illustrated in the Figure below:

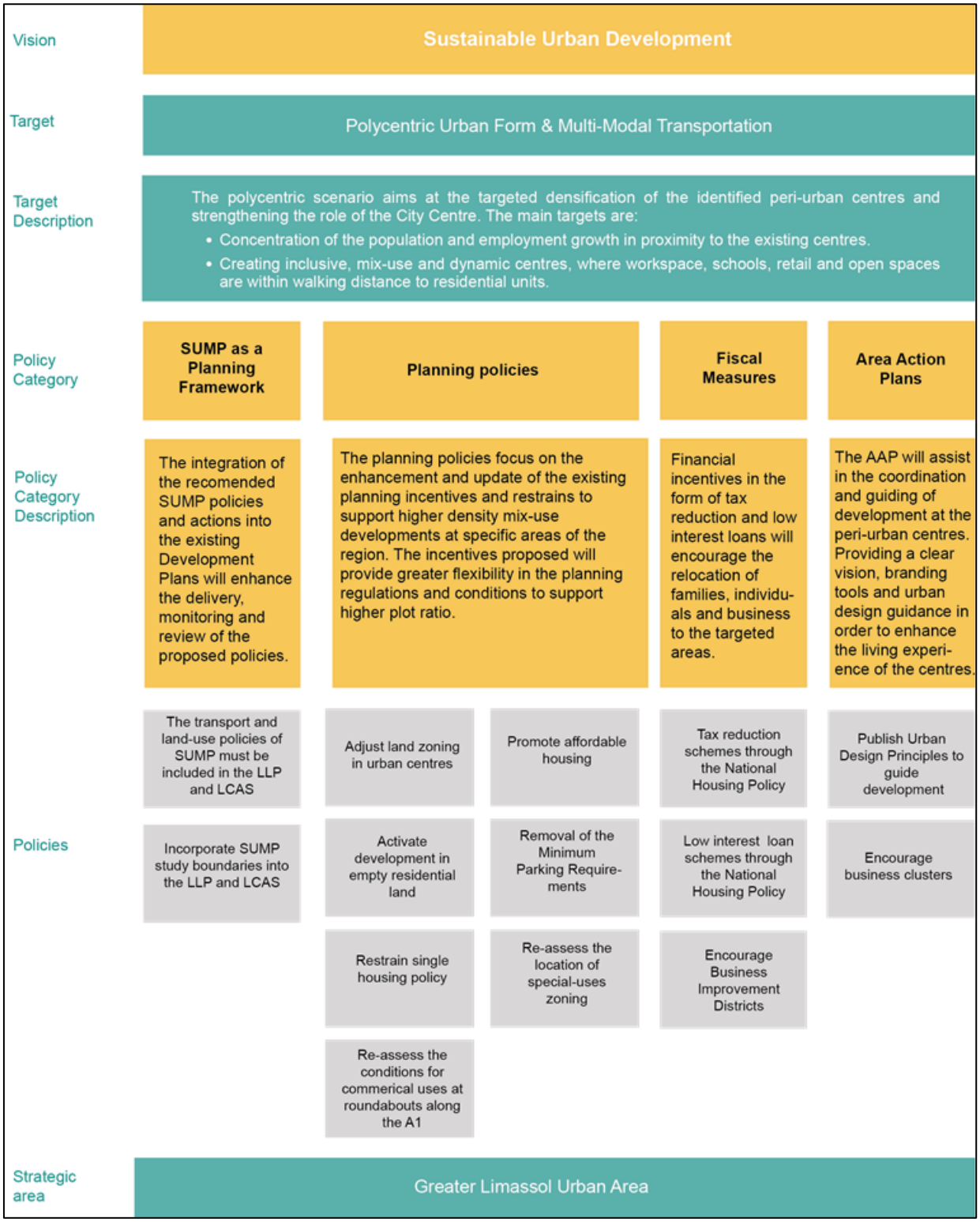


Figure 11: Polycentric Urban Policy

6 Implementation Plan

6.1 Introduction

The Implementation Plan is quite important for getting into the 4th Phase of the SUMP Cycle. To start implementing the SUMP proposed policies, projects, interventions, and actions, a well-structured plan containing all necessary information as well as time schedule is required. A good and comprehensive Plan can of course be a prerequisite for success only if at the same time the measures and policies proposed by the SUMP:

- have been positively evaluated from the key stakeholders and the majority of the citizens, therefore not only planning for people but also planning with people
- have been positively evaluated in terms of benefits being greater than their corresponding costs
- are technically feasible and legally permissible
- funding is available in an adequate pace

The current implementation plan builds on the work done so far regarding the Limassol SUMP and relies on decisions made up to now as well as on client's approvals of the previous project deliverables. More specifically, the Implementation Plan takes into account the staged implementation of the various interventions as placed in time during the SUMP implementation period of 10 years, i.e. from 2020 to 2030.

Cost elements of projects and interventions, proposed by the preferred SUMP scenario, are included in market values, increased by the respective VAT, currently at 19% (different from budget figures used in the CBA Analysis, net of VAT and other transfer payments such as taxes and subsidies.

6.2 Contents of the Implementation Plan

The Implementation Plan is intended to serve as a practical and useful tool to those involved during the period of preparing the project or intervention as well as during the initial steps of implementation. Since a number of interrelations between the various activities exist not only at spatial level (e.g. same or adjacent location), but also in terms of preparatory studies/works in construction, telecommunications as well as relative regulatory/legal frame, coordination activities are mandatory.

Most interventions are interrelated to other interventions which will take place at the same location and therefore they must be coordinated. Similarly, other projects or interventions may precede or follow in time, which again means that coordination will be required. The specific coordination needs depend on several factors such as the type of the project or intervention, the need for functional or design studies, the prior approval of one or more involved authorities etc. Most of these required procedures are governed by the respective legislation; therefore, if the legislation alters, these interrelationships may be altered as well. Table 3 below provides a first cut view of the SUMP program with a final list of interventions that have been evaluated through the transport model and finally selected and thoroughly discussed with the Project's Steering Committee.

In this list, the project of utmost importance for the successful implementation of the SUMP as a whole is the enhanced PT operation (ID 01). Taking into consideration the current provisions of the new concession tenders, the already allocated subsidy for PT operating cost, including depreciation and maintenance of all investments on bus fleet, depots and other equipment, amounts at 10 million per annum from 2020 until 2030. For the forthcoming two 10-year periods (2030 to 2039 and 2040 to 2049), additional PT operating costs are estimated at 13 million and 15 million Euro respectively. Project IDs 2, 3, 4, 5, 6, 7 and to some extent ID 18 for the ITS are related to the PT system enhancement. Therefore, their deployment in the first couple of years seems reasonable.

Project ID 20, dealing with the proposed integrated parking policy is also deemed of great importance and should be given special attention as it is widely acknowledged that a decision whether to use private car or not, strongly depends on parking availability, enforcement restrictions, cost of parking/hour etc. Project ID 16, 21 and 22 are related to road safety enhancements with emphasis on creating safety crossings. The remaining projects deal with pedestrianisation and bicycle ways, that involve substantial funding. Special attention should also be given to Project ID 11, the one-way street network, whose budget line is manageable and can start as early as possible. Once implemented, it substantiates the change to a new driving behaviour and prepares the citizens for a new era of mobility for the city.

The total SUMP program budget sums up to **413 million Euro** for the period between 2020 and 2032 with an anticipated average yearly spending of 40 million. All SUMP related interventions will cost **170 million Euro**, the cost of the Public Transport service enhancements at **119 million Euro,** the funding of which has already been decided at the level of the Ministry. It was found reasonable to include in this total budget **124 million Euro** for funding specific road development projects included in the reference scenario 2030 that will receive funding during the same period of the SUMP implementation, though they are neither proposed by the SUMP, nor their implementation is deemed necessary in order to deploy the programme.

ID number	Measure/Intervention Description	Implementation timeframe										
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+
		0-5 years					5-10 years					10Y+
ID 01	Enhanced level of operation for Public Transport	■	■	■	■	■	■	■	■	■	■	■
ID 02	Interchange Bus Stops			■	■	■						
ID 03	Park & Ride Stations (excluding Land cost)				■	■		■	■			
	Land Acquisition cost for Park & Ride Stations			■	■		■	■				
ID 04	Main Bus Terminal (Themistocleous)		■	■								
	Land Acquisition Cost and/or Opportunity Cost for Main bus terminals		■									
ID 05	Telematics Bus Stops		■	■				■	■			
ID 06	Exclusive lanes for Public Transport on existing roads		■	■				■	■			
ID 07	Exclusive lanes for Public Transport on new roads			■	■			■	■			
ID 08	Construction of Aktaia Odos						■	■	■			
ID 09	Pedestrianisation of selected areas to motorised traffic				■	■			■	■		■
	Pedestrianisation of selected areas to motorised traffic at the local centres of the other municipalities				■	■	■	■	■			
ID 10	Low speed limit area (<30km/h)			■								
ID 11	Increase the length of travel / one-way streets: Leontiou, Agias Filaxeos, Thessalonikis, Yitiz/ Navarinou/ Gladstonos			■								
	Increase the length of travel / one-way streets: CBD area			■	■							
ID 12	Bicycle lanes along all major corridors				■	■				■	■	■
ID 13	Bicycle only roads for fast bicycle connections					■				■	■	■
ID 14	Bicycle lanes along Sea Side Boulevard and Aktaia street		■	■								
ID 15	Safe and weather protected bicycle stands at all major destinations		■									
ID 16	Safe crossings		■									
ID 17	Adequate and wide pedestrian pavements along all urban roads			■		■						
ID 18	ITS equipment		■	■	■							
ID 19	Traffic calming measures in Traffic Calming Zone area (Buffer 1)							■	■			■
ID 20	Integrated Parking Policy		■									
ID 21	Safety Buffer Zones around primary schools and creation of accessible routes			■	■	■	■					
ID 22	Improving traffic safety in selected road network locations			■	■							
ID 23	Road Development projects	■	■	■	■	■	■	■	■	■	■	■

Table 3: The Implementation plan for the Limassol SUMP

6.3 "Early Winner" projects

The Limassol SUMP being a strategic project, has to implement a number of individual projects, many of which are interrelated either as predecessors and successors or in some other cases bound together in terms of enhancing their mutual performance. To this end, some of the most mature and highly regarded

interventions can serve as "early winners" showcasing a new era of mobility for the city. Public Transport services will be substantially enhanced in short term, with an ambitious target of more than gradually tripling PT ridership by 2030. The proposed set of projects is the following:

a. Enhanced Level of operations for Public Transport – The momentum is crucial and very positive as Cyprus is ready to air the new concession tenders while at the same time the PT telematics project is at its final stage of full deployment. Expanding hours of operation during the day and improving headways during peak hours constitute substantial enhancements that are expected to make a clear statement for what PT can deliver in the years to come (ID01), ID06, parts of ID18 for bus lane enforcement)
b. Exclusive bus lanes along a vertical arterial of the city – the concept is well known and mature and clearly underlines the importance of Public Transport as the main road transport means. Even before launch of the new contracts, EMEL (the current PT operator) will be willing to take part immediately (ID06)
c. Bus lane enforcement system – the system could be implemented in cooperation with the current PT telematics vendor who has all necessary know-how and can identify system requirements for procurement (part of ID18)
d. Bus priority system in selected signalised intersections along the selected corridor, constitutes an important Centre to Centre communication between the Urban Traffic Control and the PT telematics (part of ID18).
e. Advanced UTC (Urban Traffic Control System) is already in the pipeline for deployment and is directly bound to the bus priority system above (part of ID18)
f. Main Bus Terminal (at A. Themistocleous – ID04) and bus-only access through Kanari, Themistocleous and Anexartisias streets (ID08 through Phase 1)
g. Dynamic Bus display signs for the CBT (part of ID18)
h. Integrated Parking Policy (part of ID20)

The idea behind this proposal, is to provide the Ministry with a viable and ready to be implemented package of interventions fully related to PT operation but not limited only to these operations as it includes parking policy implementation as well as construction of the new CBT at Andreas Themistocleous str. These set of projects have a lot of common characteristics to play this role:

- PT is considered the backbone of the new mobility scheme for Limassol and it currently receives full support by the Ministry
- The Integrating Parking policy is already ranking very high to the municipality's agenda
- ITS related projects are relatively easy to implement, their budget it manageable and their cost to benefit ratio is very high.
- Cyprus in recent years has entered a new development era having shown a remarkable resilience after the financial crisis of 2013. Through right choices in funding and financing resources the SUMP can be implemented according to the plan.

7 Monitoring and Evaluation Plan

The Monitoring and Evaluation Plan (M&E Plan) is an integral part of the SUMP planning cycle (8th stage) which is conducted during the plan elaboration.

The Final SUMP Report and the corresponding deliverable address the main Monitoring and Evaluation activities that should be adopted and monitored during the SUMP implementation by the key and wider stakeholders in specific timescales as defined in the implementation plan of this study. The M&E plan ensures the successful planning progress of the SUMP and the satisfaction of the predefined objectives and targets during the implementation of the SUMP measures.

The M&E Plan establishes clear procedures and describes (i) how, which and when the monitoring and evaluation activities will be carried out, (ii) who is responsible for them and, (iii) what resources are necessary to implement them. It is a living document that should be adapted to modifications during SUMP implementation stages due to non-foreseen/incidental changes or knowledge gained during the process.

The three pillars of these processes are displayed in Figure 12 below.

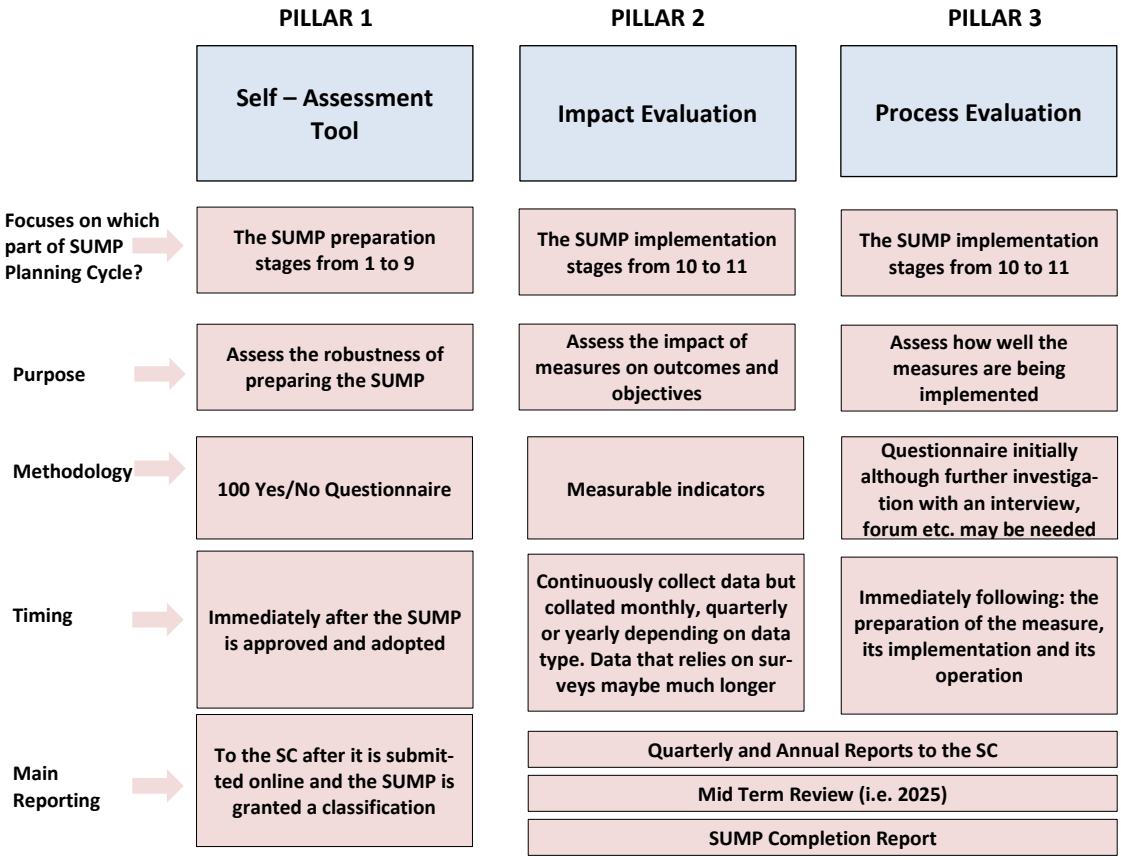


Figure 12: The M&E Framework

8 Promotion and Marketing Strategy

The Promotion and Marketing Strategy consists of two part. Part one provides a theoretic background for the marketing and communication strategy. It summarises those parts of proposed SUMP objectives, strategies, measures and approach that need to be communicated and marketed. This includes the description of vision, objectives and targets of the SUMP for Limassol, the communication challenges, risks and barriers, the prerequisites for success, the SUMP stakeholders involved in the change of transport and mobility system, their reaction to date and an initial marketing and communication SWOT analysis. While the first two of these subsections are quite theoretic, the analysis of stakeholders is already more specific and related to the actual stakeholders of the Limassol metropolitan area. These stakeholders are also distinguished into different levels of influence on the SUMP and levels of being affected by the SUMP, as these different levels need to be addressed individually and in parallel.

Part two describes the strategic approach to the Marketing and Communication Strategy. The programme for the SUMP is what is often called a Public Awareness Programme. It should comprise both marketing and two-way communications. Part two of the marketing and communication strategy provides more details on the marketing and communication objectives as well as the marketing strategy, including key messages, channels of communication, a key partner programme, educational initiative as well as specific activities with and for retailers and residents of the Historic Centre as well as the resources necessary for the implementation of the marketing and communication strategy. Finally, the cost of the marketing and promotions programme is estimated for year 1 and for the following years.

9 Strategic Environmental Impact Assessment

A Strategic Environmental Assessment (SEA) Study was conducted for the Sustainable Urban Mobility Plan (SUMP) of Limassol in accordance with the Terms of Reference of the SUMP Study and the provisions of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive) and the respective national Assessment of the Impact on the Environment from Certain Plans and/or Programmes Law (No.102(I)/2005). The main objective of the SEA study is to identify the likely significant effects on the environment and the reasonable alternatives of the Limassol SUMP and to propose measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment from the implementation of the Plan.

The SEA study commenced in WP9 with the scenario assessment exercise and was fully completed in WP14 with the finalisation of the Limassol SUMP. The SEA study contains the main environmental effects of the SUMP and the mitigation measures proposed to address these impacts. The main environmental impacts covered are: Air quality; Climatic Factors; Soil/Geology; Water Resources; Fauna, Flora and Biodiversity; Material Assets; Landscape; Built Environment and Spatial Planning; Cultural, Archaeological, Architectural and Natural Heritage; Socio-economic Environment; Population, Human Health and Quality of Life. Based on the strategic environmental assessment conducted, the implementation of the Limassol SUMP is expected to result in considerable positive effects on the natural and human environment of the Study Area. This however is anticipated, since the SUMP promotes and has been prepared in line with environmental sustainability principles in order to address the existing transport related issues in Limassol. The majority of the negative impacts identified by the SEA are generally manageable and can be appropriately mitigated by the measures recommended by the SEA.

10 Conclusions

Cyprus has recognised the environmental and economic consequences of cities dominated by cars. It has, therefore, involved itself in the European SUMP4Cyprus initiative and wishes to embrace the underlying philosophy of the programme. The promotion of 'sustainable transport' is, however, quite a complex idea and touches many areas: health, environment, socio-economic factors, quality of life and even happiness. This is further compounded by the average Cypriot's attitude to their cars, which they are unlikely to give up without a fight or incentives, which will make them change their behaviours. Any change programme can take years to bed in successfully. We are aiming to change long-ingrained behaviours of a whole country.

The project of developing a Sustainable Urban Mobility Plan SUMP for Limassol is not just a planning project. It includes planning of the future transport and mobility system, but it is a process. This process is based on a strong interaction between the team of planners, consultants, decisions-makers with the relevant stakeholders and the public, aiming at explaining and discussing the principles, the ideas, the background, the methodologies and the approach. This was carried out be a number of Key Stakeholder Committee meetings, by a number of public participation events, by communication via media, internet, by surveys of residents and stakeholders. Input, comments, critics and proposals by stakeholders, by affected groups and residents were taken on board, were discussed and responded. The result is a SUMP for Limassol that is broadly accepted.

Decision-makers and planning authorities have been involved, stakeholders and affected groups, NGO etc. making sure that these institutions and persons accept the SUMP for Limassol and take ownership of the SUMP, the approach, the strategies and the measures. Only with this interactive approach can it be ensured that the SUMP will not only be a study but will be a project that changes the mobility sector in Limassol completely over the next years, a paradigm change for mobility.

The proposed SUMP, the strategies and measures included in the plan are ambitious, require strength of planning institutions and will result in considerable behavioural changes. The impacts and effects have been modelled and calculated, they have been analysed and described in the various deliverables of the project. The strategies and measures are necessary, not always easy to implement. Still, in some cases these strategies and measures do not go far enough, can only be seen as a first step towards the final situation. But even a big change, even a paradigm change of mobility has to start with a small step. And this start is defined by the proposed SUMP for Limassol. The SUMP strategies include an integrated approach of adopting the future land-use development and the future transport and mobility system.

Relating to land-use, a polycentric planning strategy is proposed, reflecting the vision for sustainable transportation in Greater Limassol Area, proposed by the SUMP and ensures that the transport policies proposed are compatible with the urban form and land uses of the Greater Limassol Area. The strategy is divided in four policy sections which are developed in depth, in order to deliver the targeted densification of the peri-urban centres and to strengthen the role of the City Centre. Guiding future population and employment growth in proximity of existing centres and creating inclusive, mix-use and dynamic centres, where amenities and jobs are within close distance.

The integrated and holistic approach of the SUMP must be endorsed by the decision-makers and key stakeholders, through the integration of the recommend transport and land use policies in the Development Plans. Although the key principle of compact and mix-use urban form is imperative to the delivery of the SUMP objectives, it is recognised that the transport related measures of the SUMP can also work independently, not completely rely on the full implementation of the proposed polycentric scenario.

Relating to transport and mobility, an integrated and well-balanced strategy between “carrots” and “sticks” has been designed, carrots being incentives for changing behaviour, more attractive alternatives for mobility, improved public transport systems, more space for pedestrians and non-motorised use of public urban space, less accidents and increases safety and security, less pollution and noise in the dense urban areas, the sticks being restrictions for car uses, pricing of parking, limitations of access to the centre by car etc. This well-balanced combination has been favoured by the stakeholders of Limassol and is the one that will lead to the necessary changes.

In the proposed future mobility system of Limassol, there will be a remarkable increase of the Public transport passengers. This is mostly because of the combined measures of more PT frequent services with a respective in-crease in the itineraries, the bus lane and BRT schemes, the parking control measures and 5% increase in fuel costs. In spite of the very good performance in the increase of PT passengers from less than 2% to estimated 9.4%, the target of PT share of 10% by the year 2030 is only marginally reached. In the longer-term, a drastic measure for a bold increase in PT share in Limassol, similar to the “Congestion Charge” London scheme could be considered, particularly if objectives like a modal share of 20% for public transport are to be reached that would not be unreasonable for a city of the size and structure as Limassol.

Also, a significant increase of pedestrian trips from 5.7% to 10.1% and a modest increase of the trips with bicycles from 0.7% to 1.9% is calculated. This reflects the changes in the land use Polycentric Urban Policy, with a number of small distance trips that can be completed on foot or by bike and also the implementation of bicycle paths and new pedestrian areas. The calculations show a very positive impact in the environmental indicators due to the proposed strategies and measures for the future years. All emission pollutants are significantly decreased. Also, the noise level in urban roads are restricted to an acceptable level of less than 65db during the day time. Still, the proposed plan is not sufficient to reach the target value of 24% reduction in CO2 by 2030. Supplementary policy measures would be necessary, restricting the car use further, increasing public transport shares and shares for non-motorised transport further and for the remaining car traffic including the promotion of electric cars and electric buses in Limassol.

The proposed SUMP for Limassol, discussed and accepted by stakeholders and residents is a milestone in the development of future mobility for Limassol. If implemented and if all necessary changes are accepted, then it achieves remarkable impacts in terms of sustainability,

- Environmental sustainability: reduction of Green House Gas emission from transport, mainly CO2, reduction of emission of pollutants and emission of noise,
- Social sustainability, increasing the share for non-motorised use of public urban space, reducing the negative impacts on safety, reducing number and severity of accidents, increasing the walkability in the city and the freedom of movement for all population groups, the children, the young, the old, the mobility impaired and generally those without access or without willingness of using a car, and
- Financial sustainability, increasing the profitability of public transport, increasing the potential for businesses in Limassol, particular shops, tourist attractions like hotels, bars, restaurants etc.

The months and years to come will show, whether the proposed and planned changes will be fully implemented to lead to the necessary change. If this is the case, then further development should be planned and implemented, limiting car transport further, improving alternatives even more. But these further and more severe limitations on one hand and improvements on the other hand can neither be politically proposed now nor can they be financed now. Both will only be possible when the first changes will become apparent and the positive impacts on the environment, the social life and the financial situation will become apparent and accepted by the public and the administration.