



VINNYTSIA AUTOMATED FARE COLLECTION - REGULATORY FRAMEWORK



CIVITTA

ROM

SAYENKO KHARENKO

Strategy report

Vinnytsia Automated Fare Collection - Regulatory Framework

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FOREWORD



Vinnytsia Mayor

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Vinnitsia is the progressive city in Ukraine and enjoys a vibrant social and cultural life. The city serves as a commercial, cultural and educational hub for the entire region thus attracting significant number of passengers entering the city on a daily base. The city of Vinnitsia is expecting to grow steadily with new projects rising up in the centre and in its district.

The City Transport Strategy for 2016-2029 aims to facilitate this growth and provide improved transit mobility. The strategy's starting point is the adopted Urban Transport Strategy 2014,

“Комплексна стратегія міського транспорту і просторового розвитку”.

During the strategy's draft stage, we consulted with stakeholders to incorporate concepts and suggestion raised. The need to integrate and harmonize the public transport scheme and linking it city development was raised consistently thus standing in the heart of the strategy.

The city has a long legacy of providing high quality electric public transport service. This strategy aims to leverage infrastructure, technology, service, institutional into the 21st century proving the



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EXECUTIVE SUMMARY

This strategy sets new key directions, policy targets and plans for the city. By 2029, the people of Vinnitsa will be serviced by a transport system that provides a high-quality, integrated, safe and sustainable service to the entire population. This system will contribute to economic development in the city and the nation overall, while significantly reducing negative environmental impacts. The strategy will contribute to improving the quality of life in Vinnitsa, a city in which it is attractive to live and work.

KEY POLICIES:

- Rehabilitate facility of Tram and purchase new rolling stock to improve level of service
- Improve Trolley-Bus service by improving its infrastructure and service
- Improve Bus service
- Regulate service of Marshutka and improve level of service
- Introduce Electronic Ticketing System
- Optimize PT network
- Integrate public transport modes into one harmonized scheme
- Introduce ITS
- Strengthen institutional framework
- Better regulatory framework

STRATEGY GOALS:

- Increase the market share of sustainable transport modes (public transport, walking and cycling)
- Improve level of service for PT users and make service more convenient
- Improve financial sustainability of public transport operation
- Reduce air pollution emissions and GHG
- Improve road safety condition for Public transport users
- Ensure full integration between municipal urban planning and transport planning

MAJOR ACTIONS FOR 2017-2020

- New Tramway section on Kotsyubinski.
- Modernize tram stations
- Add another stop on Soborna
- Trolleybus Lane on Kotsyubinski
- Trolleybus Lane on Kyivska
- Trolleybus Lane on Pyrohova
- New Trolleybus section T0216 .
- New Trolleybus section Andrey Sheptytsky str.
- New Trolleybus section Nemyrovske road
- New Trolleybus section Bazotka – Lypovetska
- Passenger information system
- Rehabilitate lanes with new asphalt
- Re-arrange traffic circulation on south bridge
- Realign Marshutka lines to operate
- Consolidate operators under few PSC
- Integrate with PT
- Modernize fleet

ABBREVIATIONS LIST

Rada	Vinnytsia Municipal Government
BAU	Business as Usual
BOT	Build-Operate-Transfer
BRT	Bus Rapid Transport
CVST	City of Vinnytsia Sustainable Transport
CO₂	Carbon Dioxide
CNG	Compressed Natural Gas
DBOT	Design-Build-Operate-Transfer
Dept.	Department
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EU	European Union
EURO V	most recent European Emission Standard
GEF	Global Environmental Facility
GHG	Greenhouse Gases
KM	Kilometers
Km/h	Kilometers per hour
Gr.	Ukraine Grivna currency
ITS	Intelligent Transportation System
LEZ	Low Emissions Zone
LRT	Light Rail Transport
M	Million
M-tons	Metric Tons
NO_x	Nitrogen Oxides
P&R	Park and Ride
PM	Particulate Matter
PPP	Public-Private Partnership
PT	Public Transport
ROM	ROM Transportation & Engineering Ltd.
SLA	Service Level Agreement
SUTS	Sustainable Urban Transport Strategy
TM	Traffic Management
TIA	Traffic Impact Assessment
TOD	Transit Oriented Development
TVM	Ticket Vending Machine

1 INTRODUCTION

1.1 BACKGROUND

The City of Vinnitsia decided to define its long-term strategic framework for the development of its public transport network and services which will extend the recently approved urban transport strategy 2014. This strategic document considers a wide range of public transport related issues and provides a holistic, integrated, long-lasting and consistent framework for decision makers dealing with transport related issues. This document was initiated by the EBRD through the City of Vinnitsia Sustainable Transport (CVST) project, and was developed together with relevant stakeholders from Rada and elsewhere.

1.2 OUR STRATEGY



2 WHY VINNYTSIA NEEDS A PUBLIC TRANSPORT STRATEGY



Replacing ad-hoc decisions with long term vision

Traditionally, most decisions regarding public transport investments and operations in Vinnitsia are performed on an ad-hoc basis, with the aim to solve an immediate problem. Such decisions lack integration with other sectors and may even contradict other decisions and efforts. In a transport strategy, all decisions in all sectors are aimed to achieve a common long-term vision for the city.



Ensuring mobility for all

The recently adopted transport strategy of Vinnitsa promotes sustainable modes and favour them over private car. However, the city needs a more detailed road map and action plan that will enable us to fulfil this strategy. We want to ensure long term mobility and accessibility to all Vinnitsia citizens. A public transport strategy that focuses on mobility for all will achieve this purpose.

Integrating transport with urban planning

Vinnitsia is growing and new neighbourhoods and regions are being planned for development. A public transport strategy will enable the provision of better transport services to new areas while ensuring that new development does not negatively impact on traffic in the older parts of the city.

3 WHY A PUBLIC TRANSPORT STRATEGY IS PROPOSED

Despite some investments and improvements in the public transport sector in Vinnitsa in the last few years, the service and the infrastructure can be significantly improved. In order to bring passenger back to public transport, to ease congestion and to reduce environmental footprint the city needs to prioritize investment in public transport and strengthen its institutional and regulatory framework



A pedestrian amongst parked cars in the city center

Source: UNDP CAST

● Sustainable urban public transport is a system that provides long-term and continuous high quality mobility and accessibility for all members of the population, while positively contributing to the environmental, social and economic sustainability of the community overall. ●

3.1 THE INTERNATIONAL CONTEXT

In the mid-1990s, many countries recognized that the transport trends of the time were not sustainable and that existing policy frameworks seemed unable to move society towards a more sustainable public transport future. Many governments began to develop new public transport policies that focused on moving people rather than cars, and made sure that transport systems would be more environmentally friendly and less polluting. Cities like Singapore, Dubai, Kuala Lumpur, Seoul, Bogota, and New York started to shift from expanding their road networks towards investing in sustainable transport modes. This shift meant improvements to public transport, increased parking regulations, the creation of pedestrian areas and introduction of bicycle facilities on a large scale.

Further supporting this shift, at the beginning of the present century, major international institutions like The World Bank, the European Bank for Reconstruction and Development (EBRD), the United Nations Development Programme (UNDP),

started to promote the development of sustainable urban transport strategies in developing countries. All of these efforts had a common aim to decrease GHG emissions and pollution, clamp down on uncontrolled urbanisation and implement more integrated planning.

Cities that have adopted sustainable transport strategies have since found that they more efficiently allocate their budget on urban transport than previously. These cities have become more attractive places for residents and businesses and offer a higher quality of life than others that have not followed suit.

3.2 THE NATIONAL CONTEXT

GREEN ECONOMY STRATEGY

Ukraine aspires to EU. In addition to the main conditions for joining the European Union, which Ukraine has committed to perform, there is also a condition of compliance with the norms of the European Union in the field of transport. And this themselves mobile standards including the amount of exhaust gases released into the environment, the availability of convenient and safe movement of vehicles and service of passengers on public transport, at bus stops and on the Internet and green economic strategy.

THE POINTS OF FURTHER ELABORATES ON MEASURES TO BE ADOPTED IN THE TRANSPORT SECTOR:

1. PROVIDING AN OPTIMAL STRUCTURE FOR THE TRANSPORT FLEET BY MEANS OF MONITORING AND THE PROMOTION OF FUEL EFFICIENCY
2. DEVELOPING ALTERNATIVE TYPES OF TRANSPORT AND RESPECTIVE INFRASTRUCTURE, IN PARTICULAR FOR ELECTRIC CARS AND GAS-FUELLED CARS
3. ENSURING THE USE OF HIGH QUALITY FUELS
4. DEVELOPING AN INCENTIVE CAR DISPOSAL PROGRAM
5. IMPROVING THE TRANSPORT FLOWS CONTROL SYSTEM (SMART TRAFFIC CONTROL SYSTEM)

3.3 THE LOCAL CONTEXT

In recent years, different departments in Rada developed strategic development plans, master plans and action plans that partly supported public transport policies. Municipal Departments of roads, passenger transport, economic, environmental protection, law enforcement, architecture and natural resource management each separately set long term targets, identified major development directions and prioritized investments. For example, while the road department set a clear three-year action plan for the local road scheme, the passenger transport department separately released strategic and action plans for 2016-2029 that were recently approved by the mayor.

This document, however, confronts much larger challenges and proposes a clear strategy and action plan. It adopts ideas and concepts from different resources and integrates them into one consolidated framework that communicates with all relevant departments.

UNIQUE URBAN CHALLENGES

Urban regeneration

The population in Vinnitsia is constantly changing with younger generation entering the city on the expense of the elderly one. In addition, the city is planning to keep on growing especially in the south region. In preparation for this growth, the municipal architecture department has developed a new urban master plan.

With this change, it will be necessary to have a properly integrated transport system to ensure that the city will continue to grow in a sustainable manner.

Investments in infrastructure

The city is providing major investments for transport infrastructure. In recent years, a significant amount of money was allocated to the development of new roads and additional road construction is planned. However, while the traffic situation has improved over time, it has become evident that it is not sustainable as will be discussed later. Therefore, it is important to ensure that the impacts of these investments will be efficient and in-line with the transport strategy policy.

3.4 THE URBAN TRANSPORT CONTEXT

EXISTING URBAN TRANSPORT STRATEGY

Currently, there is no official urban transport strategy document that governs decisions in the transport sector in an integrated and balanced manner. However, it can be understood implicitly that the de-facto transport strategy is to give priority to car users. This strategy is evident from the following current activities:

- Road construction
- Free and unregulated parking in the city centre
- No priority given to trolley buses or buses in road space or at traffic signals
- Very limited allocation of road space for bicycle users
- Limited integration between transport modes

This de-facto strategy is far from sustainable.

INCREASING CONGESTION AND TIME SPENT IN TRAFFIC

As standard of living arise, more and more families consider purchasing private vehicles. This trend, evident all over the world, and especially in Ukraine poses great challenges to the ability of the Public Transport to keep attractive and provide high quality solution for all. The current performance of the transport system is in general good but must improve in order to provide adequate service for those who can afford having private vehicles.

While existing traffic speed in Vinitza is in general good, it is expected that the increasing car ownership and the lack of proper priority to PT will further reduce the overall car and PT speed, thus creating more local traffic jams.

INCREASING POLLUTION

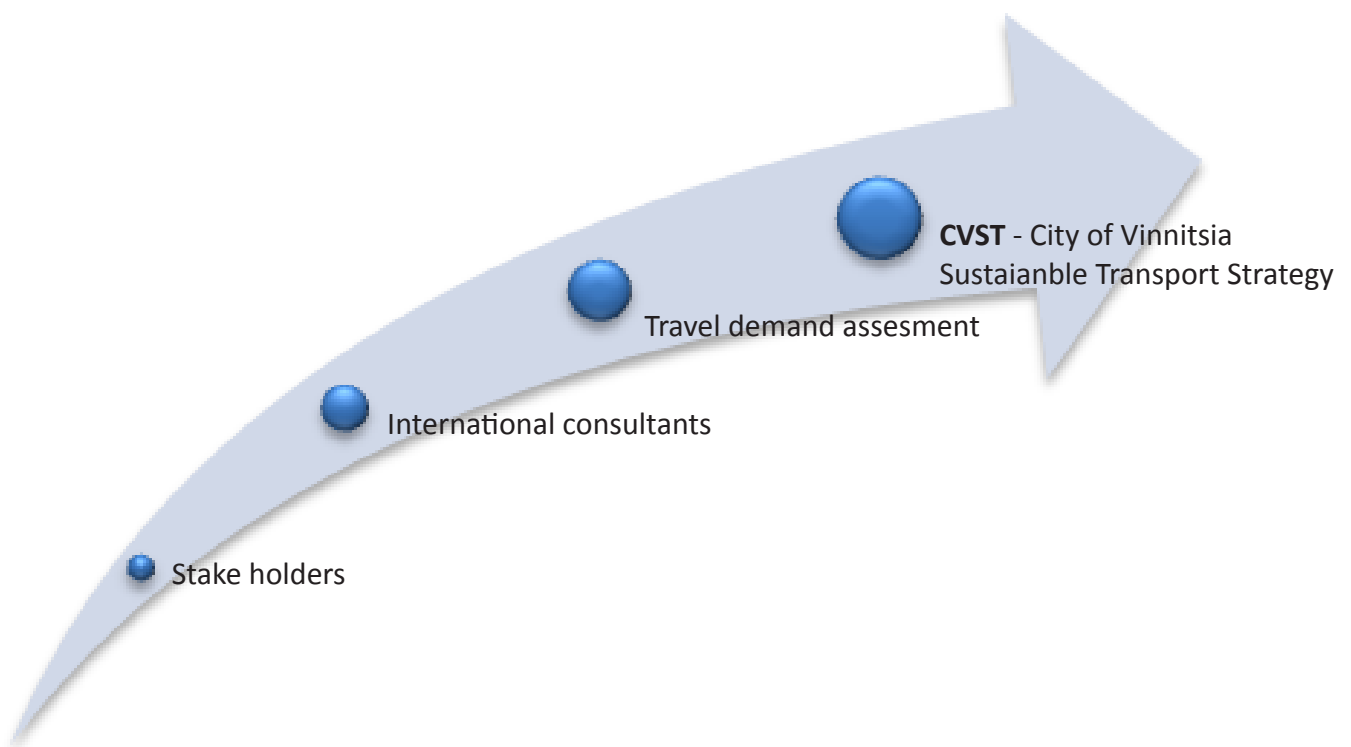
In spite of the big investments in transport infrastructure in the recent years, the current urban transport system in Vinnitsia is not maximizing its environmental potential. It is necessary to keep on investing in clean electric public transport as well as fulfilling the potential of the non-motorized movements (walking and cycling).

3.5 THE PROCESS FOR CREATING A PUBLIC TRANSPORT STRATEGY FOR VINNITSIA

To avoid this bleak future, this document presents a strategy for sustainable urban transport for Vinnitsia. This strategy was prepared as part of the EBRD “City of Vinnitsia Public Transport” (CVST) project. As such, the mayor’s office committed itself to prepare a sustainable transport strategy.

The objective of the CVST project is to reverse the trend of increasing GHG emissions in the transport sector. This is being done elsewhere in the world by promoting the use of sustainable transport modes like public transport, walking and cycling, over the use of private cars.

The following strategy was the result of international and national efforts.



4. CHALLENGES

Vinnitsia's transport system is diverse and intense, and is composed of multi-modal urban public transport, including official and grey taxis, and different types and sizes of transport service vehicles. Additionally, there is growing private car ownership, new energy alternative vehicles, passenger and freight rail, an international airport.

Managing and synchronizing such a diverse system is challenging, and is even more difficult for a city such as Vinnitsia that has experienced social change.

Based on the transport master plan approved in 2014, we adopted the following Key Indicators for horizon year 2029:



- **Congestion will increase significantly so that average morning peak hour trips will decrease from 22 km/hr to 14 km/hr**



- **Traffic jams will spread to more streets and to more hours during the day**



- **Pollution, and especially GHG emissions, in the city will increase by 25% in the next 10 years**



- **The morning peak hour speed of buses in the city will shrink from 16 km/hr to 12 km/hr, increasing public transport operating costs**



- **Low income groups will be disconnected from use of the city's services**

This is a description of a city which is not attractive to its residents, and contributes negatively to national economic growth.

The sustainable transport strategy in this document directly confronts the following challenges:



4.1 INCREASING CONGESTION

While in general, roads in Vinnitsia are wide, congestion is becoming a major problem in some arterial and collector streets, mainly during peak hours. Increasing car ownership will inevitably generate more congestion which will affect the service on non-prioritize public transport corridor.

4.2 ENVIRONMENTAL CHALLENGE

Increasing car use and continuous city sprawl generate rapid growth in overall vehicle kilometres travelled. On the other hand, the existing motor vehicle mix of Vinnitsia is quite old.

4.3 NEGATIVE IMPACTS ON THE ECONOMY

In recent years, Vinnitsia enjoyed significant economic growth. However, this growth is being diminished heavily by increasing congestion.

4.4 SOCIAL EXCLUSION

While Vinnitsia's roads and streets are mainly used by private vehicles, many people can't afford proper mobility since private cars are too expensive for them. Since many public transport passengers need to take more than one bus for their daily commute to work, the cost of their trip doubles. This makes the poor unable to afford the daily commute to work. In addition, people who suffer from mobility difficulties will suffer even more: the elderly, disabled people and children, all face the unpleasant environment of private car domination.

Therefore, one of the challenges facing Vinnitsia's transport system is the inclusion of the poor in the social structure and the provision of efficient, safe and affordable mobility.

4.5

INADEQUATE PT SERVICE

Today, around 45% of all trips are done by public transport (PT) in Vinnitsia. PT modal share has declined in recent years and will continue to lose ground given increasing car ownership and insufficient level of service.

Although substantial investments have been made in public transport over the past years, these are mainly related to rolling stock (“hardware”). To improve the quality of public transport and offering an attractive alternative for car use, the focus should shift to an overall quality improvement of public transport in all aspects. This means, a well-designed route network, sufficient capacity, and high quality passenger information.

Did you know?

In developed cities with good public transport systems such as Zurich, Paris, and London, the share of public transport for all trips is more than 60%.

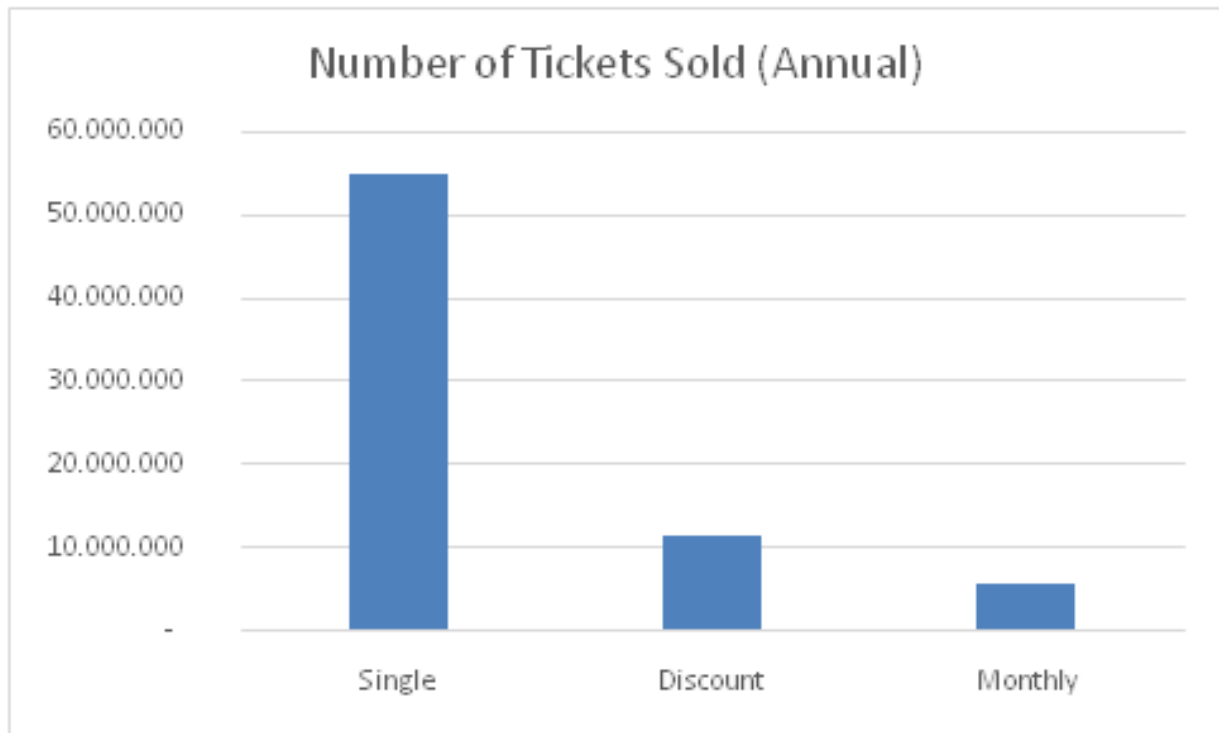
Public transport in Vinnitsia suffers from various challenges which are not unique to the city:

1. **Lack of Integration.** Today, the bus system is not well connected to the tram network, nor does the bus network properly feed passengers into the tram. Furthermore, the ticketing system for the various modes does not integrate them.
2. **Low operating speed.** Trolley bus are the major public transport mode in Vinnitsia. The average bus speed is approximately 16 km/h, the average tram speed is 15 km/h. Even during midday hours, buses operate at very low speeds 17 km/h.
3. **Crowded buses.** Most buses, trolley and tram are congested the entire day, since sufficient capacity is not provided.
4. **Old and highly polluting vehicles.** The public transport scheme in Vinnitsia is heavily based on electric transport which provide low environmental impact. However, the abandoned Marshutka service which are run mainly on old and polluting fleet offset part of the electric ZERO emission benefit. It is critical to control the usage of the Marshutka and introduce cleaner vehicles to this segment/
5. **Integrated ticketing scheme.** A lack of an integrated ticketing system means that passengers who use single tickets and need to switch from one bus to another, have to pay twice. This creates a major affordability challenge for low income families who spend a high proportion of their earnings on public transport.

Did you know?

The trolley, and tram system in Vinnitsia is among the most congested systems in Europe with over 950 passengers per bus per day. Passenger dissatisfaction is at 60% with the most common complaint being that buses are too crowded.

Currently a single ticket costs 2 gr. for trip by trolleybus and tramway and 2,5 gr. for a trip by bus. Monthly ticket costs from 160 gr. currently, this requires a passenger to make minimum 80 trips monthly, discount monthly ticket for students costs from 80 gr. requiring only 40 trips monthly. Not many passengers need to make so many trips to justify the cost of a monthly pass.



6. **No passenger information.** Passengers waiting at stops do not have any information about when the next bus will arrive. In most cases, bus stops, nor signs or maps of the bus routes or system.
7. **Poor network service.** The current bus network was developed when Vinnitsia was smaller and less developed, and only minor adjustments have been made since its growth. Due to changes in travel patterns and urban development, the system is far from optimal.
8. **No priority on roads or at traffic signals.** Lack of priority for public transport on main corridors limited the potential advantage of Mass-Rapid-Transit in the city.

4.6

LACK OF INTEGRATION BETWEEN PUBLIC TRANSPORT AND URBAN PLANNING

Vinnitsia's urban master plan proposes to add major new land uses to the city: a large residential neighbourhoods and other areas, as well as big commercial land uses in several locations. These projects often do not consider the negative impacts they may produce on the current public transport system, since analyses are usually not conducted. New road developments do not include proper bus stop facilities, bus lanes or worth a proper electric infrastructure to support clean transport and high level mobility.

4.7

URBAN SPRAWL

Many city areas in the world suffer from ongoing suburbanization and sprawl. Negative impacts of sprawl include longer travel time, high trip costs, limited or non-existent public transport service, social segregation, difficulty in promoting cycling as a mode of transport, high spending on new roads, and the loss of open spaces and natural beauty.

Because Vinnitsia is currently growing the most at its periphery and neighbouring communities, the city needs to reconsider the above implications and make a clear decision with regards to how it takes the suggestions of this transport strategy and applies it to the urban master plan.

4.8 NO PARKING OR ACTIVE TRAFFIC MANAGEMENT

Traffic management is a cost effective tool that can alleviate congestion rapidly. For example, in several intersections, long queues are formed because vehicles that want to turn left do not have a dedicated left turn lane or left turn signal.

In addition, in most of the downtown streets, there are limited parking regulations, so commuters can park their cars for an entire day for free as they choose. This increases the number of cars that enter and leave the city centre on a daily basis.

Worldwide, there are plenty of technological parking solutions (smart phone applications, Short Message Service



Vinnitsia car disorderly

4.9 LIMITED REGULATORY CAPACITY

Urban transport planning requires professional staff, several technical tools and open-minded decision making. Relevant staff in Rada involved in planning the future transport system and maintaining the existing system, are well experienced and skilled, but limited in number. In addition, the organizational structure of the municipality is not properly defined with respect to transportation issues. Responsibility over transportation is divided amongst multiple departments without a sufficient clear coordination mechanism amongst them. This hampers an integrated approach toward sustainable transport solutions.

4.10 UNSATISFACTORY REGULATORY FRAMEWORK

The current regulatory framework towards the provision of transport services is not well defined. Public transport operators do not always meet the service level agreement. Such practices damage the level of service for passengers, and in some cases, even expose operators to unnecessary loss.

5. VISION AND GOALS

5.1

A PUBLIC TRANSPORT VISION FOR VINNYTSIA

In order to facilitate the development of a long-lasting, fast, affordable, accessible, public transport and financially stable transportation system in Vinnitsia, The following vision is set:

The transport system of Vinnitsia has to meet a wide range of needs and support different types of activities and population groups.

By 2030 Vinnitsa will have the most sustainable transport system in Eastern Europe and will be named "The green city of Ukraine". Its citizens will enjoy a transport system that is integrated, fast and safe, with high-quality services for the entire population. The system will contribute to the city's economic development while limiting its environmental footprint.

Our first goal for the transport system is for it to **support the economic growth** of the city and the nation overall. As Vinnitsia transforms into a major national and regional hub and business centre, we need to ensure that the transport system can facilitate such growth. The city is committed to continuing its fast economic and urban development through the provision of a sound multi-modal transport service for the benefit of its residents, its employees and its visitors.

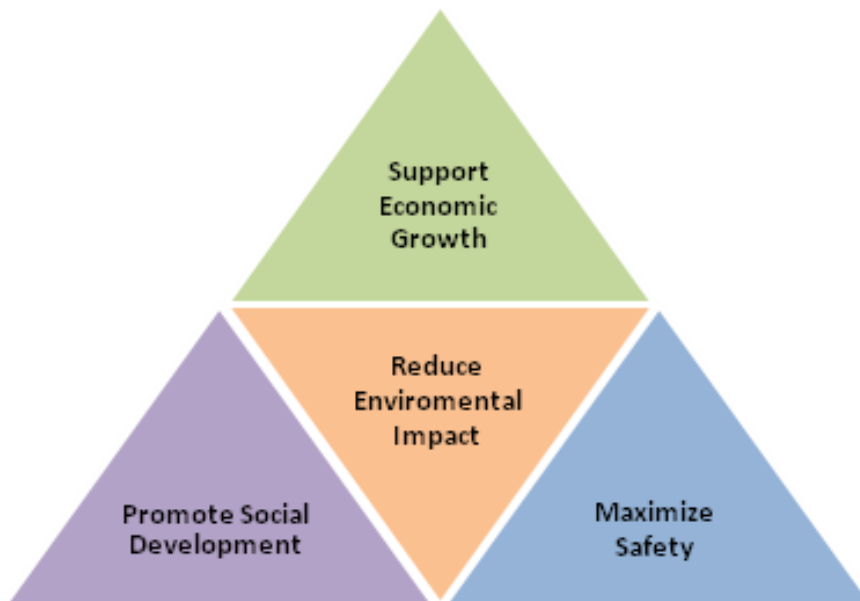
The second goal is for the transport system to **promote social development** by ensuring that the entire population receives affordable, fast and reliable access to different types of activities across the entire municipal area. The City of Vinnitsia will maintain its commitment to providing reliable and affordable transport to its most vulnerable populations (pensioner, youth, people with special needs, etc) which in many cases have no access to a private car. The city will provide high-quality transport to ensure access to medical, social and community services.

Our third goal, which is critical to sound economic and social development, is the need to **minimize the environmental impact** of the transport system. The city will keep prioritizing cleaner and environmentally friendly modes of transport at the expense of existing dominant car use, in order to improve air quality in the city and reduce its environmental footprint on the planet. The city will also be committed to providing high-quality transport services that promote a more efficient use of existing land and protect existing open and green spaces.

The last goal is to make the **transport system safe and secure**, especially to those who are currently at high risk of automobile related injury (such as pedestrians and cyclists). All people travelling in or

through Vinnitsia should be confident that they can use our transport network free from the threat of harm. While this will directly impact public wellbeing, it will also provide an indirect benefit to society in economic terms.

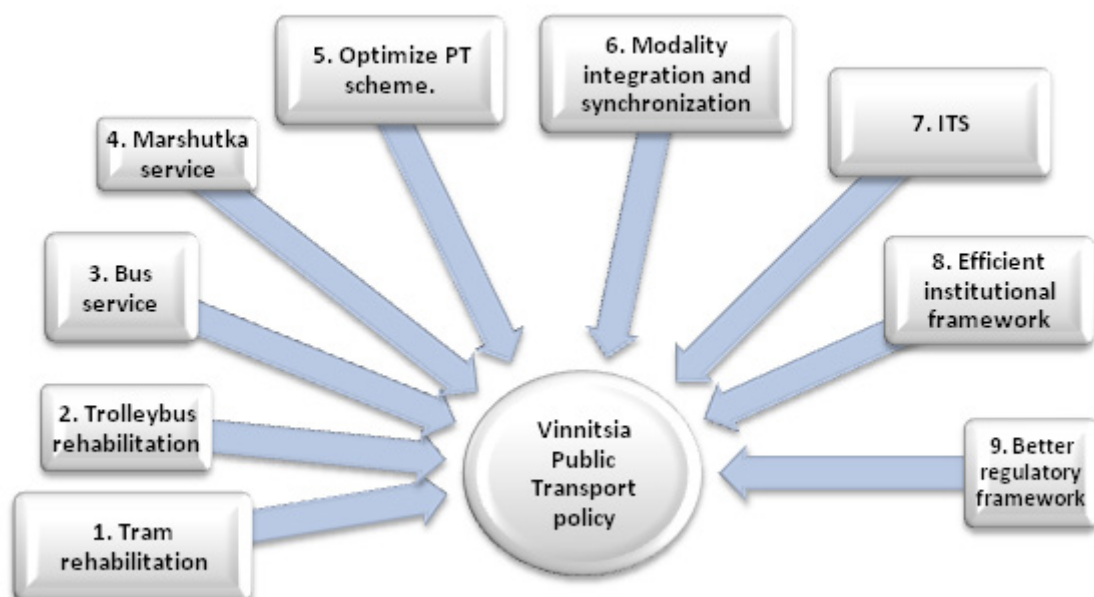
These four goals are summarized in the figure below:



The ultimate goal of this vision is to make Vinnitsia an attractive city in which to live and work; a city that cares about the quality of life of its citizens and its business community.

5.2 SETTING HIGH-LEVEL POLICIES

In order to obtain the vision and the goals set above, the city need dto adopt nine major transport policies. These policies will govern decision making in Vinnitsia over the next 10 years. The following chart illustrates these policies:



For each policy area, several measures and strategies were developed and are presented in the following section.

5.3

SETTING CLEAR AND MEASURABLE TARGETS

In order to select the most efficient transportation strategy, a set of quantitative measures that can be defined and used periodically will need to be implemented. This procedure will ensure that plans and investments are sound and incrementally shift the city toward achieving its goals.

ID	TARGET		STATUS 2016	NO INTERVENTION 2030	SUT 2030 TARGET	
1	Share of sustainable modes		55%	48%	60%	
2	Share of electric transport passengers from PT		63%	55%	73%	
3	Average public transport speed (km/h)		18.2	15.2	19.1	
4	Integration	Fare	Limited	Limited	FULL	
		Schedule	No	No	FULL	
		Info	No	Limited	FULL	

In addition, the city must set three additional qualitative targets:

Target #5: An affordable and accessible public transport network for all population groups especially the elderly, the youth, and the disabled.

Target #6: Integrate transport and land use development and consider potential urban expansion based on accessibility capacity

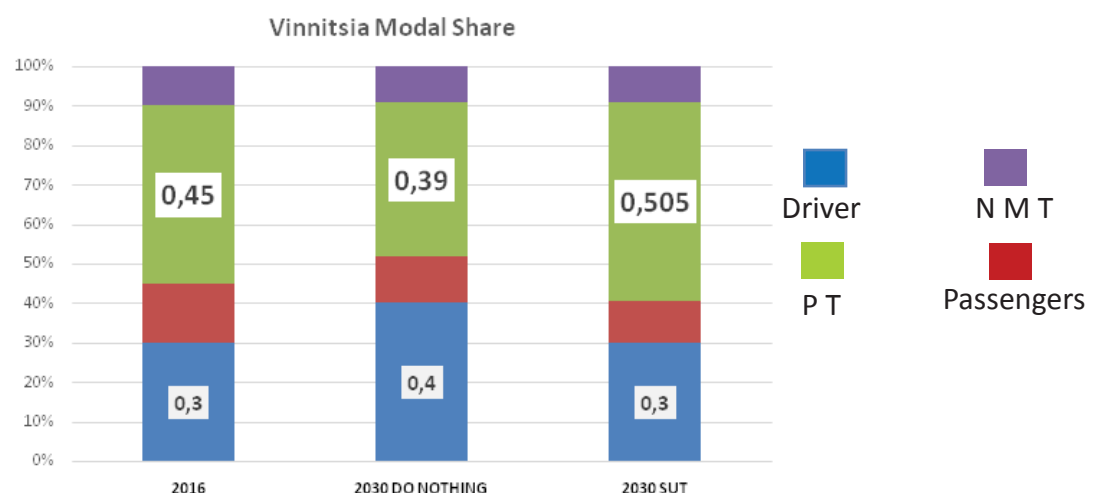
Target #7: Establishment of a single tariff for public transport, including the transfer to other routes between the different means of transport and an interactive system of payment for travel.

Target #8: Strengthen institutional framework and consolidate all relevant department under one decision body to plan / regulate / manage the Urban PT sector

Target #9: Manage traffic and parking smartly

Target #10: Integrate suburban and inter-city public transport within urban PT scheme

The following graph presents existing mode share of trips in Vinnytsia compared to the projected one for 2030 assuming No sustainable transport strategy will be adopted and in case such a strategy is adopted and implemented.



6. POLICIES AND MEASURES

In this chapter, we present the high-level policies in more detail and the specific measures that the city will adopt. Together, these policies and measures form the new sustainable transport strategy for Vinnytsia 2030.

The City of Vinnytsia set eight strategic policies that will facilitate the sustainable development of a prosperous city. The high-level policies are further elaborated into a set of 8 policies, as demonstrated in the following table and elaborated in the chapter thereafter.

Policy	Index	Measure	economic	social	enviro	safety
1. Tram rehabilitation	1-A	Expand tram network by constructing new section on Kotsyubinskogo (1.30 KM) and re-align two lines	+	+	+	+
	1-B	Modernize Tram Fleet including level boarding rolling stock (74 rolling stocks)	+	+	+	+
	1-C	Modernize tram stations into accessible low floor stops with ITS		+		+
	1-D	Introduce signal prioritization at intersections with significant Tram service (>10 per hour).	+		+	
	1-E	Add another stop on Soborna west of bridge	+		+	
	1-F	Rehabilitate the electrical system, including overhead wires, substations, etc.	+		+	
2. Trolleybus rehabilitation	2-A	Extend Trolleybus to Bazotka (2.3 KM), Nemyrovske (2 KM), T0216 (2 km) and Sheptytsky (3.5 km)	+	+	+	
	2-B	Construct Trolleybus lanes at bul. Kotsyubinskogo (1 KM), Kyivska (2.5 KM) and Pyrohova central (0.45 KM)	+	+	+	
	2-B	Introduce real time passenger information system at TB stops		+		
	2-C	Introduce signal prioritization at intersections with significant Trolleybus service (>15 per hour)	+		+	
	2-D	Rehabilitate the electrical system, including overhead wires, substations, etc.	+		+	
	2-E	Modernize Trolleybus fleet and purchase more to operate in new sections (74 rolling stocks)	+	+	+	+
	2-F	Rehabilitate lanes with new asphalt on major trolleybus corridor	+			+
3. Bus service	3-A	Modernize bus fleet (all low floor), total 50 buses.	+	+	+	+
	3-B	Construct new bus stops at districts (approximately 10 bus stops)		+		+
	3-C	Rehabilitate bus depots.	+		+	
	3-D	Re-arrange traffic circulation on south bridge intersection including bus priority lane on bridge, add pedestrian bridge	+	+		+
4. Marshrutka service	4-A	Realign marshrutka lines to operate at designated feeder and suburban lines	+	+		
	4-B	Consolidate operators under few PSC, each per route or bundle of routes	+			
	4-C	Integrate with PT including designated subsidy (ticketing, schedule, stops, information)	+	+		
	4-D	Modernize fleet and consider purchasing electric vehicles	+	+	+	+

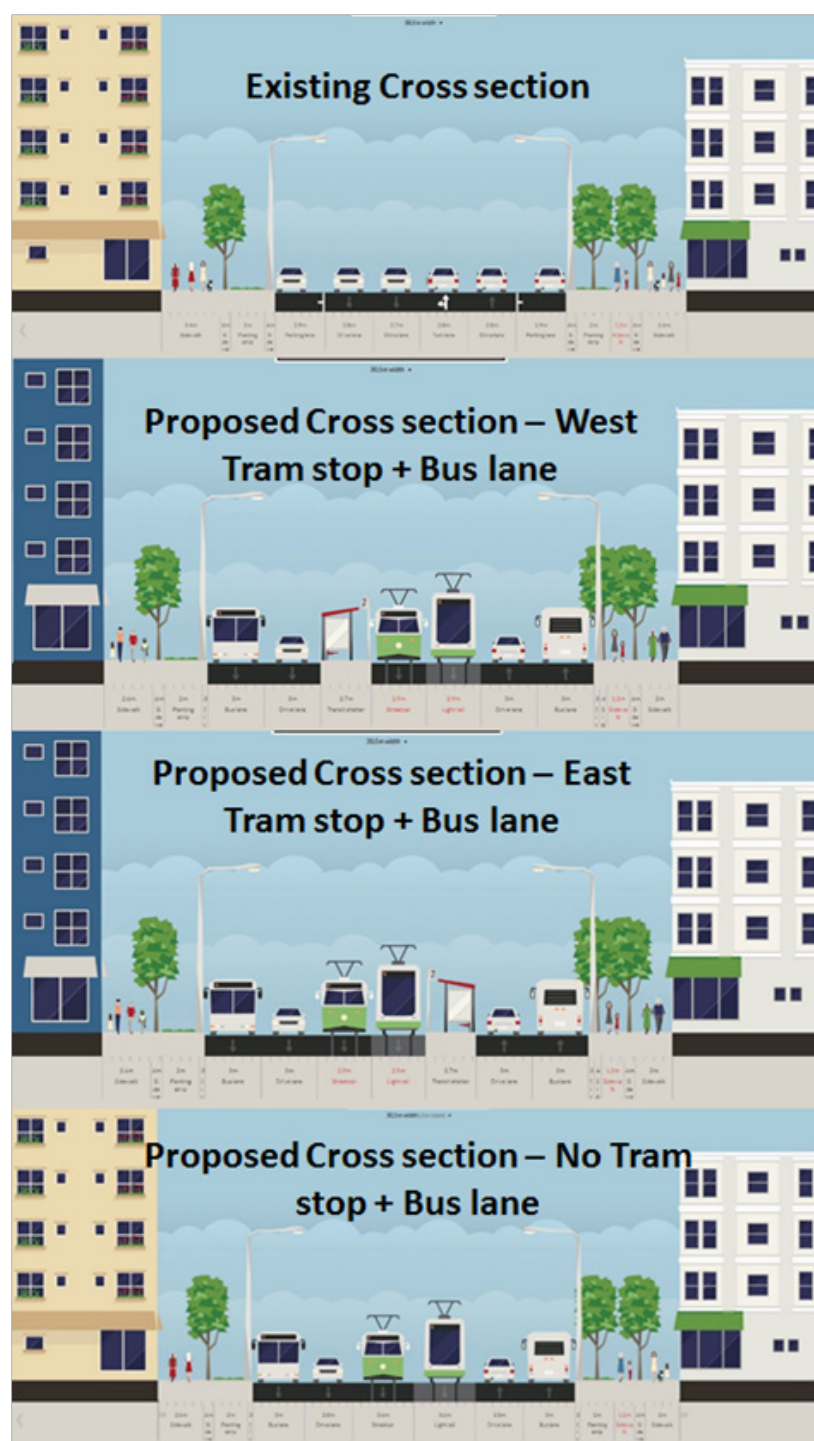
5. Optimize PT scheme	5-A	Define hierarchical network with suitable Level of service per layer	+	+	+	+
	5-B	Re-design PT network to eliminate overlapping service on same corridor (example line 5 trolleybus and 25 bus line)	+			
	5-C	Enhance bus/Marshrutka network to suburbs (10 bus lines)	+	+	+	
	5-D	Re-Design bus stop area in front of the train station	+	+	+	
6. Modality integration and synchronization	6-A	Build central bus stops (hub) at city center (3 stops)	+	+	+	+
	6-B	Renumber routes to have unique number and unique identification per mode		+		
	6-C	Integrate ticketing into a unified electronic system for all 4 PT modes	+	+		
	6-D	Introduce static information (maps, scheduling) at PT stops		+		
	6-E	Harmonize location of PT stops (especially Tram<-->Trolleybus and Tram <-->Bus	+	+		+
	6-F	Construct 2-4 Park and Ride facilities the main entrances to the city from Highway around.	+		+	
	6-G	Re-design space in front of train station (Vokzal) and autovokzal on Kyivska to enable easy transfer		+		+
	6-H	Integrate PT with cycling by offering boarding bicycle on Tram, designated bike parks and cycling path to major stops	+	+	+	+
7. ITS	7-A	Enforce car traffic along Soborna str. with special LPR cameras		+	+	+
	7-B	Introduce Integrated Electronic ticketing system for all 4 PT modes (stage A: Tram, TB and Bus) with smart phone (NFC) technology for charging / validating	+		+	
	7-C	Develop Public Transport management system to monitor /regulate PT and to facilitate real time passenger information (including GPS on all PT vehicles)	+	+	+	+
	7-D	Introduce real time information (signs at stops, data for smartphone apps.) with integrated scheduling for all 4 PT modes	+	+		

6.1 POLICY 1: TRAM REHABILITATION

6.1.1 MEASURE 1-A: EXPAND TRAM NETWORK BY CONSTRUCTING NEW SECTION ON KOTSYUBINSKOGO (1.30 KM) AND RE-ALIGN TWO LINES

Kotsyubinskogo Street is the central thoroughfare leading from the railway station to the city center. We propose to prioritize Mass Rapid Transit in this corridor by expanding the Tram network on this 1.3 km section and designing the road so that Tram and Trolleybus service will be prioritized. Upon the introduction of reliable and frequent service, it will minimize the movement of taxi and car traffic along this section and will improve level of service for passengers.

The width of the street from: 30.5 meter – 46.9 meter. The following cross section is the narrowest one



6.1.2 MEASURE 1-B: MODERNIZE TRAM FLEET INCLUDING LEVEL BOARDING ROLLING STOCK (76 ROLLING STOCKS)

The existing Tram fleet is quite old and the average age of rolling stock is 30-40 years. In addition, the fleet are mostly high floor at 90cm from road level, reducing its accessibility.

The new fleet will be entirely low floor, air-conditioned, and well equipped with ITS including validators, information (static and real time signs and voice), and transmitter to enable priority at traffic lights.

The following table presents the fleet renewal plan for the city. We propose that 80% of the fleet will be a standard 24m while the rest (30%) will be 32m long to accommodate more passengers.



The following table presented shows that the fleet must be operated and renewed on an annual basis.

Year	New Rolling stock	Scraping	TOTAL FLEET
2016	4	2	76
2017	6	6	76
2018	6	6	76
2019	6	6	76
2020	6	6	76
2021	6	6	76
2022	6	6	76
2023	6	6	76
2024	6	6	76
2025	6	6	76
2026	6	6	76
2027	6	6	76
2028	6	6	76
2029			76
2030			76
TOTAL	76	74	

6.1.3 MEASURE 1-C: MODERNIZE TRAM STOPS WITH DEDICATED LOW FLOOR PLATFORM AND ITS

In order to improve the tram service into a world-class light rail system, the city will need to improve the tram stops and define designated areas where passengers can board and alight freely without any risk or accessibility challenges. Such platforms require delicate traffic design (including traffic lights for pedestrian crossing) and special attention to urban design \ to make the space inviting and comfortable for passengers.



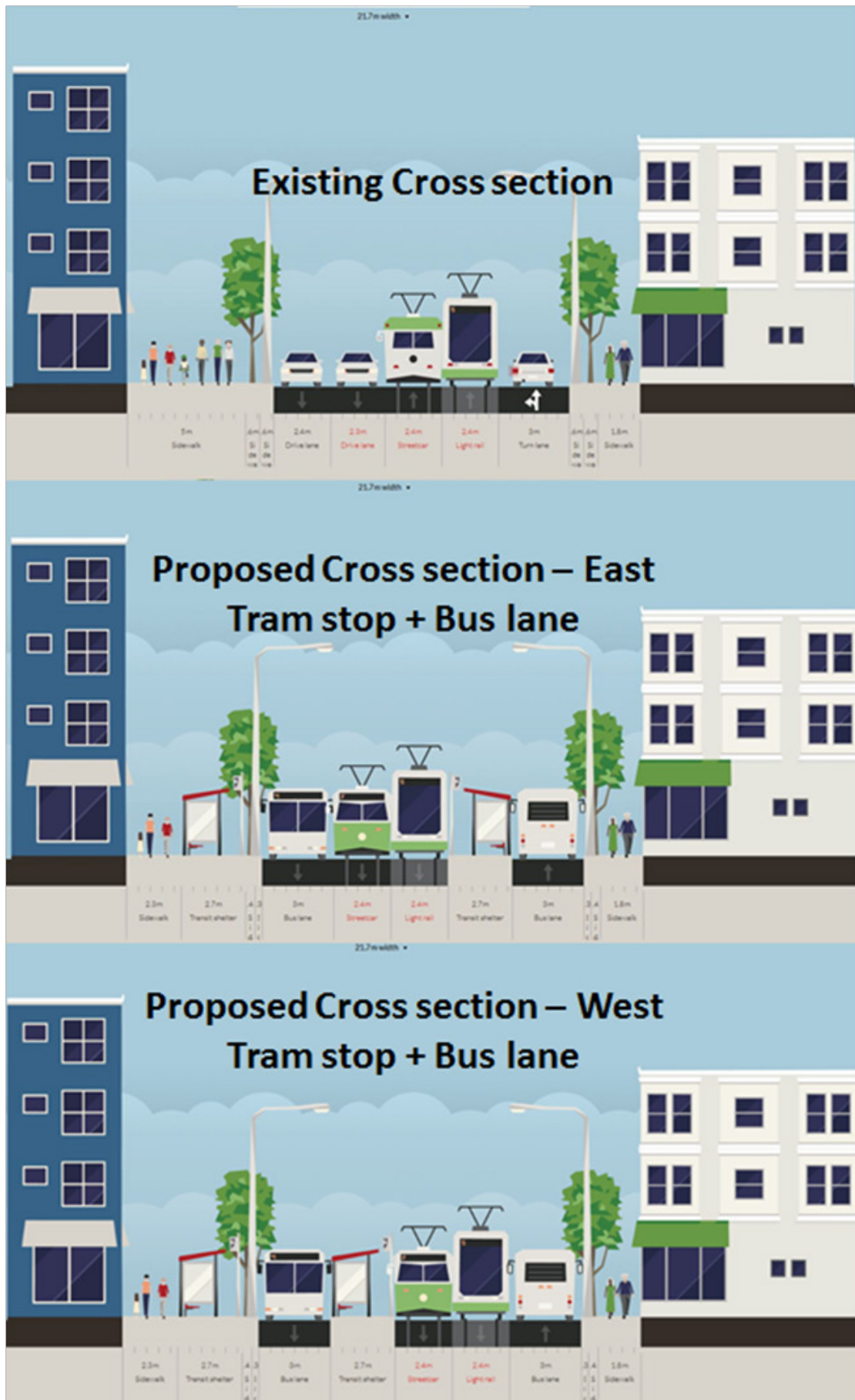
Each Tram stop should include at the minimum:

1. Comfortable and covered standing-sitting space
2. Wide platform with sufficient space for all passenger
3. ITS equipment including ticketing validators and TVM (Ticketing venturing machines), Information (real time signs as well as static maps), voice announcements and Wi-Fi.
4. Accessibility to platform from all directions by foot/cycling traffic
5. Designated lighting during operation

The following table presents existing and proposed stop modernization

TYPE	EXISTING	IMPROVEMENT NEEDED	COMMENT
Full stop with shelter and adequate space	30	Level boarding ITS	Typically, where tram runs aside from street
Designated Stop without shelter	40	Shelter Level boarding ITS	Typically, where tram runs aside from street (Pirogova)
Only sign (No shelter, no platform)	8	Full stop	Tram runs on street (Soborna, see example of CC)

Proposed new cross section of Soborna Street, 21.7 meters:



6.1.4 MEASURE 1-D: INTRODUCE SIGNAL PRIORITIZATION AT INTERSECTIONS WITH SIGNIFICANT TRAM SERVICE (>10 PER HOUR)

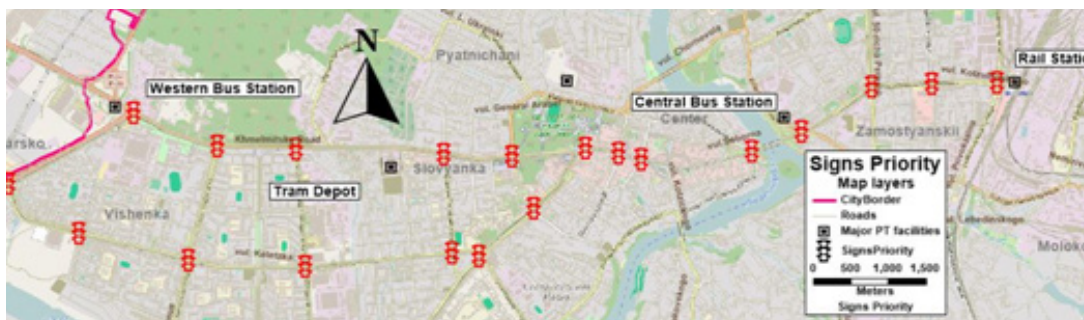


To allow buses to operate smoothly and reliably, they will be given priority on roads. Along many main streets, special tramway lanes will be allocated, and trams will be given priority at some traffic signals to minimize waiting time.

For example: Khmelnytsky Road has special signals for tramway.

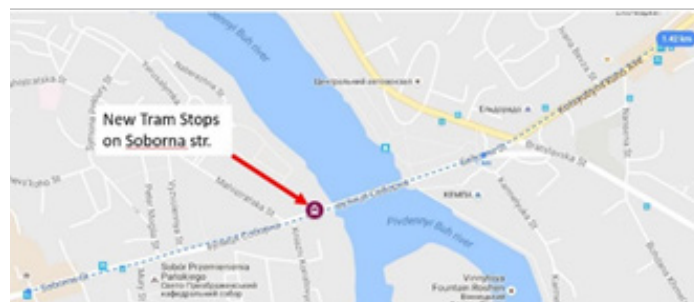
In total, we propose to introduce intersection priority at 20 intersections (considering the new tram operational plan defined in chapter 6.5)

The attached map presents the intersections to be prioritized:



6.1.5 MEASURE 1-E: ADD ANOTHER STOP ON SOBORNA WEST OF BRIDGE

The standard distance between two stops is 500 meters. We propose to add an extra tram stop outside the Soborna Street in the vicinity of the bridge.



6.1.6 MEASURE 1-F: REHABILITATE THE ELECTRICAL SYSTEM, INCLUDING OVERHEAD WIRES, SUBSTATIONS, ETC.

This measure includes all electric needs for both tramways and trolleybuses.

Our strategy increases the usage of electric transport by strengthening the tram and trolleybus modes on the expanse of the marshrutka. This will require additional investment in the existing electrical system, including additional substations and a replacement and rehabilitation of part of the current catenary.

The following table summarizes our **preliminary** diagnosis of the electric need

	Current 2016	Project undergoing (2018)	Strategy 2030
Electric Fleet	206		229
Electric AM peak VKMT	2,495		2,751
Usage	120%	100%	90% (redundancy)
Sub Stations	21	25	30
Catenary	220	220	231

In order to implement the above plan, the city will need to invest in the following:

SHORT TERM

1. Adding 4 new substations by 2020 (Cost = 4 M Euros)
2. Renew existing old 19 substations (2 are new from 2014) – cost = 3.8M Euros
3. Renew existing catenary (30 KM) – 1M Euros

SHORT TERM

1. Add 5 substations
2. Add 11 km of catenary
3. Rehabilitate remaining catenary network (190 KM)
4. Track and contactor - from Vokzal north – city & state budget, 3.4 km
5. Track and contactor – On Soborna from bridge 1 km east to pedestrian – city & state budget

6.2 POLICY 2: TROLLEYBUS REHABILITATION

6.2.1 MEASURE 2-A: EXTEND TROLLEYBUS TO BAZOTKA (2.3 KM), NEMYROVSKE (2 KM), T0216 (2 KM) AND SHEPTYTSKY (3.5 KM)



We propose to extend the trolleybus network: 1) To the south-west on the T0216 road for 2 km, and the street Sheptytskogo 3.5 km thereby connecting the villages Agronomichne and Shkuryntsy to the city center. 2) Nemyrovske east on Highway 2 km to the Vinnytsia farms. 3) In the north of the street Bazotka (Kirov) to street Tarnogradskogo, thereby connecting the central parts of the city from the north.

6.2.2 MEASURE 2-B: CONSTRUCT TROLLEYBUS LANES AT BUL. KOTSYUBINSKOGO (1 KM), KYIVSKA (2.5 KM) AND PYROHOVA CENTRAL (0.45 KM)

We propose to introduce a dedicated bus lane on the following streets where existing and proposed Trolleybus and bus traffic is higher than 20 bus per hour as defined in the following table:

	Kotsyubinskogo (West and East)	Kyivska (North and South)	Pyrohova (North)
Trolleybus AM peak frequency	64	73	70
Bus AM peak frequency	87	57	29
Combined headway	151 (Per hour)	128 (Per hour)	99 (per hour)
Overall daily passengers	69,897	46,051	63,071
Proposed cross section	Both side	Both side	Northbound only

6.2.3 MEASURE 2-C: INTRODUCE REAL TIME PASSENGER INFORMATION SYSTEM AT TB STOPS

Passengers need more comfortable trolleybus stations. Stops should be equipped with comfortable seats, protected from rain, wind, and sun. Passengers at the stop must be able to use information on all routes stopping at this stop, the schedules times, and the direction of the routes. Stops must be fitted with an electronic message sign, showing real-time arrival at the nearest destinations of time.

Most of the bus stations in the city center are sheltered, wide, and in good condition. All major stops in Vinnytsia should be of comparable quality. In addition, the bus stops should include the following:

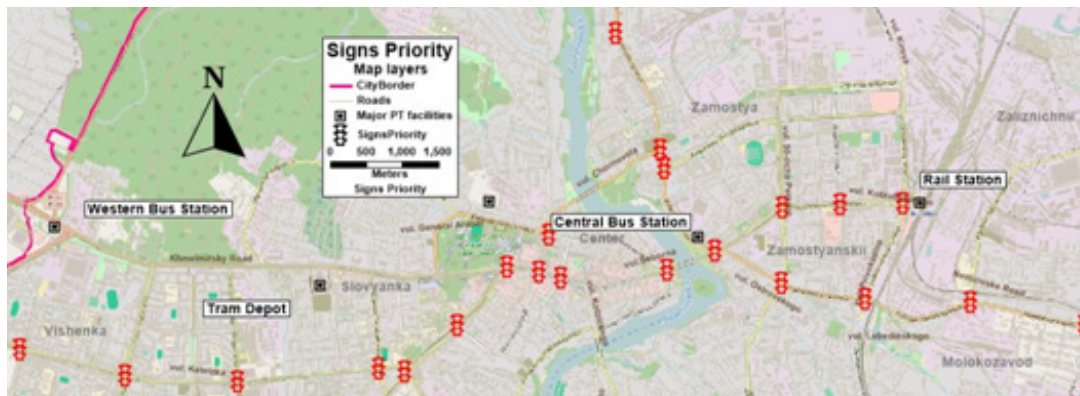
- Adequate lighting
- Accessibility for the disabled (“dropped curbs” near the stop with high pavement at the same level of the bus floor)
- See-through windows in the direction of the buses’ arrivals
- Physical information board
- Bicycle park and lock facilities
- Stopping bay for buses



6.2.4 MEASURE 2-D: INTRODUCE SIGNAL PRIORITIZATION AT INTERSECTIONS WITH SIGNIFICANT TROLLEYBUS SERVICE (>15 PER HOUR)

To allow buses to operate smoothly and reliably, they will be given priority on roads. Along many main streets, special bus lanes will be allocated, and buses will be given priority at some traffic signals to minimize waiting time.

The following map presents potential intersection for Trolleybus priority:



A municipal automatic traffic light management system will be introduced in Vinnytsia. The system will provide real-time analysis of road conditions and congestion and will manage the smart traffic light system that will ensure the efficient usage of intersection space. Traffic light sensors will be installed at intersections and will communicate with the traffic management center that will monitor traffic regularly and will adjust to real-time traffic

congestion. Overall we propose to prioritize 22 intersections where Tram, Trolleybuses, and buses will save significant time.

We estimate overall time saving at 11 daily VHT which will be saved to operators and will enable them to improve frequency by 5% with the same fleet. In addition, passenger onboards speed will be improved by 12%, equivalent to 2 minutes per trip on average.

6.2.5 MEASURE 2-E: REHABILITATE THE ELECTRICAL SYSTEM, INCLUDING OVERHEAD WIRES, SUBSTATIONS, ETC.

Please refer to chapter 6.1.6

6.2.6 MEASURE 2-F: MODERNIZE TROLLEYBUS FLEET AND PURCHASE MORE TO OPERATE IN NEW SECTIONS (132 ROLLING STOCKS)

We intend to keep expanding the trolleybus fleet and encourage private operators to purchase new vehicles of higher standards. New buses will be more client-oriented: low floors, air conditioned, quiet, and non-polluting, with three doors.



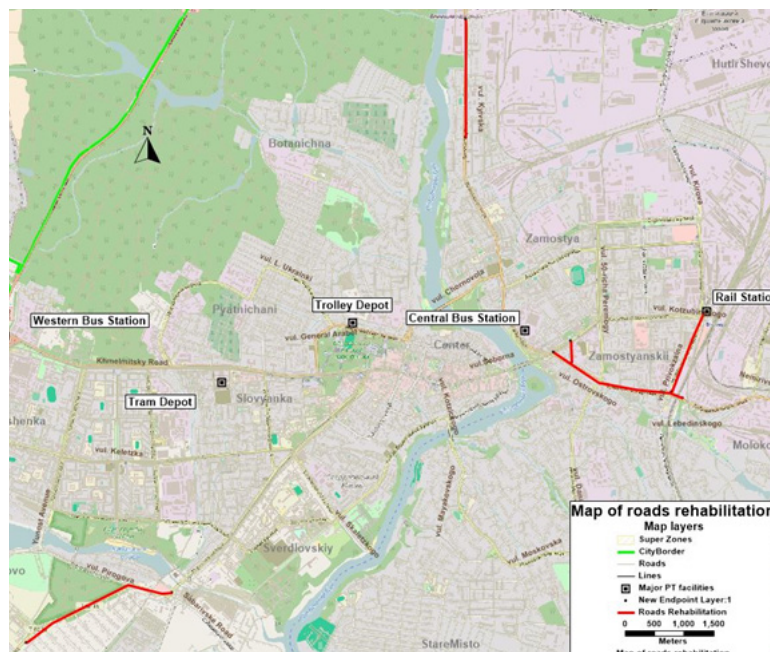
These trolleybuses should also be installed with:

- A ticketing system, so as to ensure accurate patronage data and no fare evasion.
- GPS, so that passenger information systems can track vehicle locations and furthermore, the VPTA can ensure that services are run according the Public Service Contract, in terms of operating hours, frequencies, and routes.
- Transponders to enable the vehicle-actuated signal priority measures to be implemented

Year	New Rolling stock	Scraping	TOTAL FLEET
2016	0	0	132
2017	9	0	141
2018	12	11	142
2019	12	11	143
2020	12	11	144
2021	12	11	145
2022	12	11	146
2023	12	11	147
2024	12	11	148
2025	12	11	149
2026	12	11	150
2027	12	11	151
2028	12	11	152
2029	12	11	153
2030			153
TOTAL	153	132	

6.2.7 MEASURE 2-G: REHABILITATE LANES WITH NEW ASPHALT ON MAJOR TROLLEYBUS CORRIDOR

Conditions of road surfaces have a direct impact on the state of the trolleybus traffic in the city. The same quality of asphalt affects the number of vehicle breakdowns in the trolleybus park. On the outskirts of the city, asphalt quality must be improved. Many potholes are visible in the streets, and it is necessary to lay new asphalt.



6.3 POLICY 3: BUS SERVICE

6.3.1 MEASURE 3-A: MODERNIZE BUS FLEET (ALL LOW FLOOR), TOTAL 50 BUSES

We intend to keep expanding the bus fleet and encourage private operators to purchase new vehicles of higher standards. New buses will be more client-oriented: low floors, air conditioned, quiet, and non-polluting, with three doors.



These buses should also be installed with:

- A ticketing system, so as to ensure accurate patronage data and no fare evasion.
- GPS, so that passenger information systems can track vehicles locations and furthermore, the VPTA can ensure that services are run according the Public Service Contract, in terms of operating hours, frequencies and routes.
- Transponders to enable the vehicle-actuated signal priority measures to be implemented.

Year	New Rolling stock	Scraping	TOTAL FLEET
2016	4	0	54
2017	3	2	55
2018	3	4	54
2019	3	4	53
2020	3	4	52
2021	3	4	51
2022	3	4	50
2023	3	4	49
2024	3	4	48
2025	3	4	47
2026	3	4	46
2027	3	4	45
2028	3	4	44
2029	3	4	43
2030			43
TOTAL	43	50	

6.3.2 MEASURE 3-B: CONSTRUCT NEW BUS STOPS AT DISTRICTS (APPROXIMATELY 20 BUS STOPS)

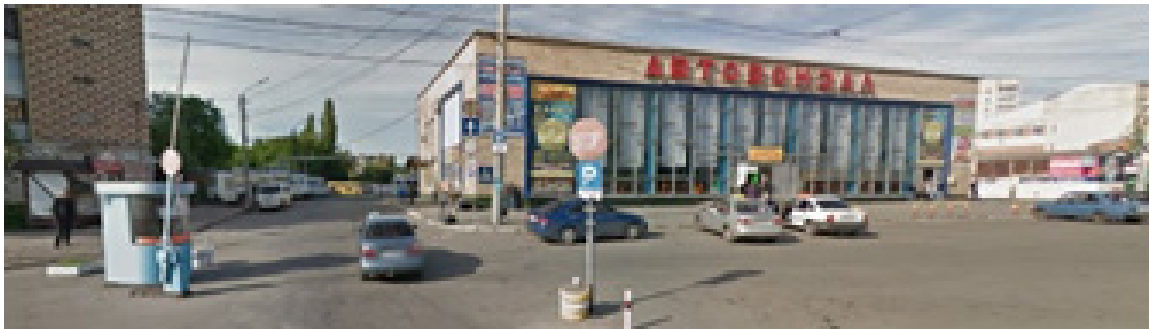
Bus Stops in Vinnytsia should be equipped with comfortable seats, protected from rain, wind, and sun. Passengers at the stop should be provided with static and real-time information on all routes stopping at this stop.

The bus stops should include the following:

- Adequate lighting
- Accessibility for the disabled (“dropped curbs” near the stop with high pavement at the same level of the bus floor)
- See-through windows in the direction of the buses’ arrivals
- Physical information board
- Bicycle park and lock facilities
- Stopping bay for buses

6.3.3 MEASURE 3-C: REHABILITATE BUS DEPOTS

We recommend to buy 43 buses Euro 6 buses to be stationed at the central bus station.



6.3.4 MEASURE 3-D: RE-ARRANGE TRAFFIC CIRCULATION ON MYKOLY OVODOVA STR. AND KNYAZEV KORIATOVYCHIV STR. INTERSECTIONS INCLUDING BUS PRIORITY LANE ON BRIDGE, ADD PEDESTRIAN BRIDGE

The south bridge is an important link to the old town for both private and public transport. Due to the high traffic volume and narrow width (12 meters) of the bridge, traffic jams often occur. For the benefit of public transport, we suggest to reserve the northbound central lane for public transport only, which can be especially important during peak hours. Another option is to widen the lanes on the bridge by removing pedestrian sidewalks; this option would require a new pedestrian bridge to be built nearby.

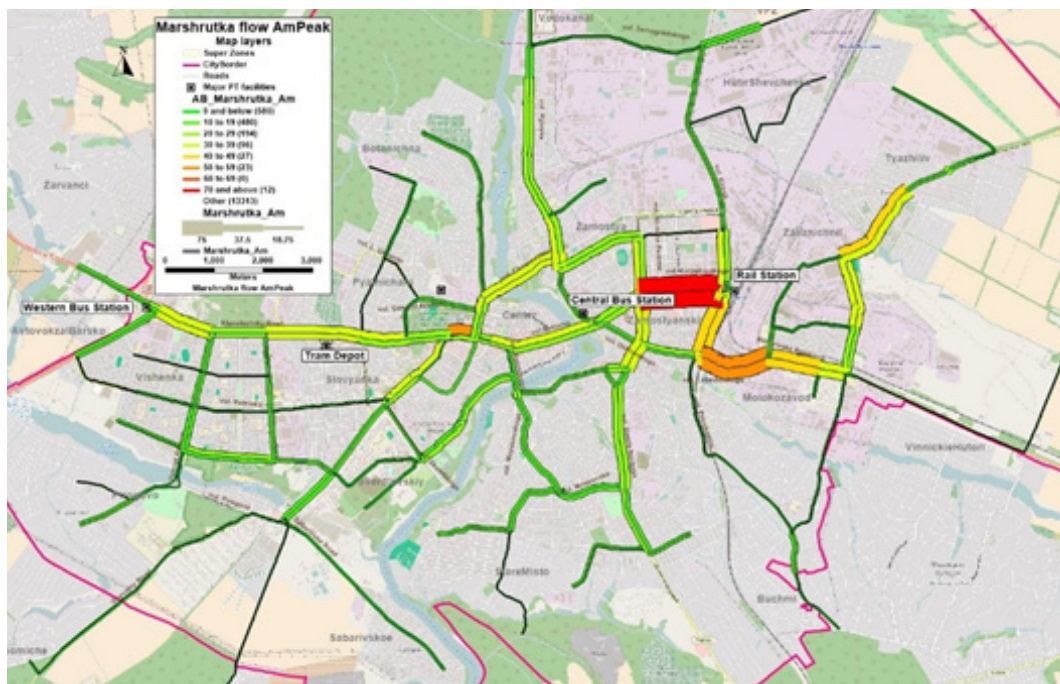


6.4 POLICY 4: MARSHRUTKA SERVICE

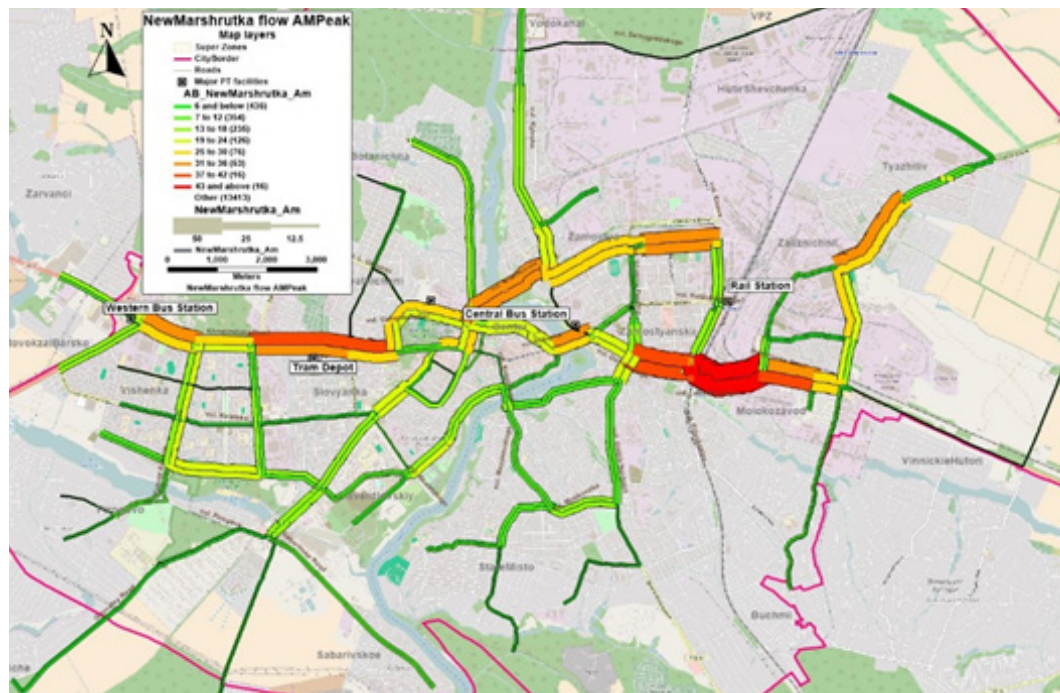
6.4.1 MEASURE 4-A: REALIGN MARSHRUTKA LINES TO OPERATE AT DESIGNATED FEEDER AND SUBURBAN LINES

We propose that the marshrutka service should be a supplement to public transportation in the city. Marshrutka can deliver passengers to places inaccessible to other forms of public transport such as narrow streets, which can be disadvantageous for the use of large capacity public transport vehicles.

There are many marshrutka lines that duplicate city bus lines, such as: 2A, 2B, 8A, 9A, 11A, 20A, 21A. We propose to abolish the duplicate marshrutka routes, while at the same time increasing the frequency of bus routes, trolleybuses and trams. Currently, marshrutka travel on the main thoroughfares of the city that are consistently filled with traffic jams. We propose to move the marshrutka routes to secondary streets, thus enabling easing the flow of other public transport throughout the city, including secondary roads. Routes 3a, 3b, 6a, 8b, 17a, 22a, 23a, 29a, 31a, 32a, and 33a can be moved to the secondary thoroughfares of the city. A map of current marshrutka services is shown below:



New situation:



Additionally, we propose to introduce more marshrutka service in the suburbs and nearby villages such as: Zarvantsi, Berezyna, Agronomichne, Prybuzke, Tyutky, Luka-Meleshkivska, Maidan-Chapelskui, Schitky, Havryshivka, Desna, and Stryzhavka. These routes should be considered suburban; their services should be kept separate from the urban routes. Suburban routes should serve the nearest bus station.

6.4.2 MEASURE 4-B: CONSOLIDATE OPERATORS UNDER FEW PSC, EACH PER ROUTE OR BUNDLE OF ROUTES

Currently there are a large number of operators in the marshrutka service sector. We propose to consolidate this service under few operators, all of whom will comply to a standard Public Service Contract with clear SLA (Service Level Agreement). Each group of lines (typically to one direction/corridor) will be tendered for several years of operation.

Existing operators can merge their activities under consolidated unions to win such tenders.

6.4.3 MEASURE 4-C: INTEGRATE WITH PT INCLUDING DESIGNATED SUBSIDY (TICKETING, SCHEDULE, STOPS, AND INFORMATION)

In order to leverage the full scale of the network and its various modes, we propose to consolidate all modes of transport under one unified and integrated ticketing scheme, which will be fully automated and electronic. This will enable passengers to transfer freely without regard to the route operators.

We also propose to introduce the electronic system within the marshrutka system. It is necessary to create a single schedule of public transport including buses. Marshrutka should complement the main public city transport. Marshrutka stops should be the same as for buses and trolleybuses, which are obliged to stop only at bus stops. Electronic displays at bus stops must inform passengers of public transport services including city bus routes, the direction of travel, and a route map.

6.4.4 MEASURE 4-D: MODERNIZE FLEET AND CONSIDER PURCHASING ELECTRIC VEHICLES

Many marshrutka vehicles do not meet necessary standards of comfort, safety, or emissions. Improving these factors will increase the overall quality of passenger service. In the marshrutka vehicles, all passengers must be provided with seatbelts. Minibuses should drive on clean fuels that do not emit smells into the vehicle. The front door should be opened only by driver of the vehicle.



Buses operated by the “Bogdan” company currently do not meet any of these requirements due to their outdated vehicles in service.

Year	New Rolling stock	Scraping	TOTAL FLEET
2016	2		74
2017	5	6	73
2018	5	6	72
2019	5	6	71
2020	5	6	70
2021	5	6	69
2022	5	6	68
2023	5	6	67
2024	5	6	66
2025	5	6	65
2026	5	6	64
2027	5	6	63
2028	5	6	62
2029			62
2030			62
TOTAL	62	72	

6.5 POLICY 5: OPTIMIZE PT SCHEME

6.5.1 MEASURE 5-A: DEFINE HIERARCHICAL NETWORK WITH SUITABLE LEVEL OF SERVICE PER LAYER

The trunk line network is usually at the top of the hierarchy, followed by tangential lines and other complementary lines with lower demand. Vinnytsia's road network should provide two contradictory functions: fast mobility (to allow cars to move from one point to another quickly) and accessibility (to allow car users to park their cars and access destinations). In order to provide these two functions efficiently, there is a need to create a hierarchical road network in which high level roads provide fast mobility and no accessibility, and lower level roads provide accessibility but with low levels of mobility. At the time of data collection, there was a large number of overlapping routes, which we suggest to omit. Our first suggestion is to extend tram routes 4 and 6 on the new tram line directly from the train station on Kotsyubinskogo street. We also propose to extend the trolleybus network in four directions. We propose to improve the ranges of movement of trolleybuses and trams in the city center on the main thoroughfares of the city, thereby avoiding routes from traveling on the secondary highways.

The following table presents the overall system operation under 3 scenarios:

1. **BASE 2016** – Situation today
2. **FULL STRATEGY 2030** – assuming the entire action plan is implemented
3. **E-TICKETING and PT OPT light (2020)** – assuming only the scope of this study (ETS & Limited PT scheme optimization is applied):

BASE 2016

Parameter	Bus	Trolleybus	Tram	Marshrutka	Total
Number of lines	15	16	6	32	69
Number of Vehicles	50	132	74	286	542
Total Routes Length	288	296	113	580	1,276
AM peak departures	66	185	83	343	677
Daily departures (from both direction)	627	1,857	762	3,487	6,733
AM Peak VKMT	657	1,696	799	3,398	6,550
Daily VKMT	6,531	18,211	7,819	36,871	69,432
Daily KM per Vehicle	131	138	106	129	128
Annual VKMT	2,434,031	6,787,383	2,914,233	13,742,038	25,877,685
AM Peak VHT	40	110	57	179	385
Daily VHT (excluding terminals)	372	1,091	523	1,829	3,816
Commercial Avg. Speed	17.54	16.69	14.94	20.16	18.20
AM Peak Passengers	5,740	17,278	10,606	10,810	44,434
Daily passengers	47,004	150,638	92,932	93,738	384,313
Daily trips per vehicle (one way)	12.5	14.1	10.3	12.2	12.4
Annual passengers	14,806,199	47,451,065	29,273,697	29,527,612	121,058,574
Daily passenger per Vehicle	940	1,141	1,256	328	709
Capacity peak hour	6,996	20,350	9,130	48,020	21,124

Present table of situation on 2020 in Vinnytsia

E-TICKETING and PT OPT light (2020)

Parameter	Bus	Trolleybus	Tram	Marshrutka	Total
Number of lines	15	16	6	24	61
Number of Vehicles	50	153	80	230	513
Total Routes Length	288	296	113	447	1,143
AM peak departures	69	204	91	265	629
Daily departures (from both direction)	628	2,043	838	2,950	6,459
AM Peak VKMT	701	1,921	830	2,634	6,087
Daily VKMT	6,640	19,452	7,912	32,539	66,543
Daily KM per Vehicle	133	127	99	141	130
Annual VKMT	2,474,626	7,249,832	2,948,921	12,127,673	24,801,051
AM Peak VHT	42	110	57	179	387
Daily VHT (excluding terminals)	379	1,166	521	1,615	3,681
Commercial Avg. Speed	17.52	16.68	15.19	20.15	18.08
AM Peak Passengers	6,084	18,660	11,667	9,352	45,763
Daily passengers	49,824	162,689	102,226	81,094	395,833
Daily trips per vehicle (one way)	12.6	13.4	10.5	12.8	12.6
Annual passengers	15,694,571	51,247,151	32,201,067	25,544,688	124,687,476
Daily passenger per Vehicle	996	1,064	1,278	353	772
Capacity peak hour	7,314	22,385	10,043	37,100	19,211

Present table of different 2020 – 2016

IMPROVEMENT ETICKETING & PT OPT LIGHT relative to BASE 2016

Parameter	Bus	Trolleybus	Tram	Marshrutka	Total
Number of lines	0	0	0	-8	-8
Number of Vehicles	0	21	6	-56	-29
Total Routes Length	0	0	0	-133	-133
AM peak departures	3	19	8	-78	-48
Daily departures (from both direction)	1	186	76	-537	-274
AM Peak VKMT	44	225	31	-763	-463
Daily VKMT	109	1,241	93	-4,331	-2,889
Daily KM per Vehicle	2	-11	-7	13	2
Annual VKMT	40,594	462,449	34,688	-1,614,365	-1,076,634
AM Peak VHT	2	0	0	0	2
Daily VHT (excluding terminals)	7	75	-2	-214	-135
Commercial Avg. Speed	0	0	0	0	0
AM Peak Passengers	344	1,382	1,061	-1,458	1,329
Daily passengers	2,820	12,051	9,293	-12,644	11,520
Daily trips per vehicle (one way)	0	-1	0	1	0
Annual passengers	888,372	3,796,085	2,927,370	-3,982,924	3,628,903
Daily passenger per Vehicle	56	-77	22	25	63
Capacity peak hour	318	2,035	913	-10,920	-1,914

Present table of new situation in Vinnytsia

FULL STRATEGY (2030)

Parameter	Bus	Trolleybus	Tram	Marshrutka	Total
Number of lines	13	16	6	24	59
Number of Vehicles	43	153	76	218	490
Total Routes Length	257	309	107	447	1,121
AM peak departures	69	204	91	265	629
Daily departures (from both direction)	628	2,043	838	2,950	6,459
AM Peak VKMT	701	1,921	830	2,634	6,087
Daily VKMT	6,749	20,693	8,005	28,208	63,654
Daily KM per Vehicle	157	135	105	129	130
Annual VKMT	2,515,220	7,712,281	2,983,609	10,513,307	23,724,418
AM Peak VHT	42	108	44	144	339
Daily VHT (excluding terminals)	382	1,080	403	1,467	3,332
Commercial Avg. Speed	17.67	19.16	19.87	19.23	19.10
AM Peak Passengers	6,601	20,734	13,788	8,648	49,771
Daily passengers	57,298	195,227	132,893	64,875	450,294
Daily trips per vehicle (one way)	14.6	13.4	11.0	13.5	13.2
Annual passengers	18,048,756	61,496,581	41,861,387	20,435,750	141,842,474
Daily passenger per Vehicle	1,333	1,277	1,751	298	919
Capacity peak hour	7,314	22,385	10,043	37,100	19,211

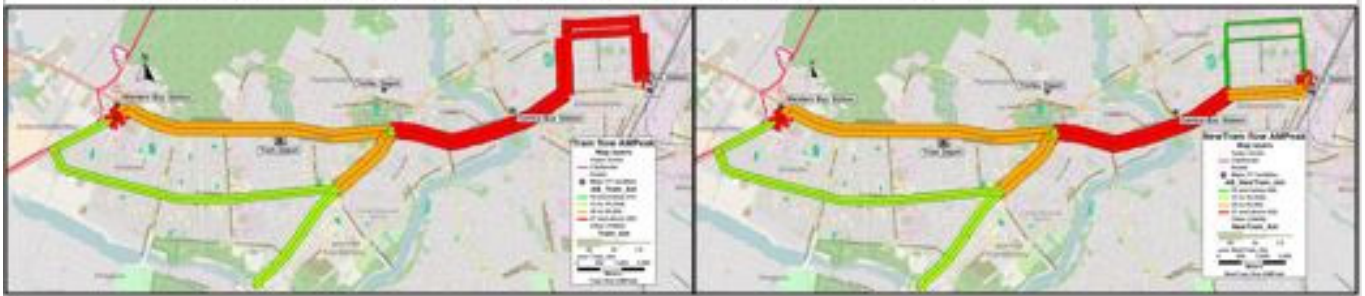
Present table of different 2030 – 2016

IMPROVEMENT Full STRATEGY relative to BASE 2016

Parameter	Bus	Trolleybus	Tram	Marshrutka	Total
Number of lines	-2	0	0	-8	-10
Number of Vehicles	-7	21	2	-68	-52
Total Routes Length	-30	13	-6	-133	-155
AM peak departures	3	19	8	-78	-48
Daily departures (from both direction)	1	186	76	-537	-274
AM Peak VKMT	44	225	31	-763	-463
Daily VKMT	218	2,482	186	-8,663	-5,777
Daily KM per Vehicle	26	-3	0	0	2
Annual VKMT	81,189	924,898	69,376	-3,228,731	-2,153,267
AM Peak VHT	2	-1	-13	-34	-46
Daily VHT (excluding terminals)	10	-11	-120	-362	-484
Commercial Avg. Speed	0	2	5	-1	1
AM Peak Passengers	861	3,456	3,182	-2,162	5,336
Daily passengers	10,294	44,589	39,961	-28,863	65,981
Daily trips per vehicle (one way)	2	-1	1	1	1
Annual passengers	3,242,558	14,045,515	12,587,690	-9,091,862	20,783,901
Daily passenger per Vehicle	392	136	495	-30	210
Capacity peak hour	318	2,035	913	-10,920	-1,914

Present Maps of Public transport networks, current and new situation.

Tram network current situation and new situation



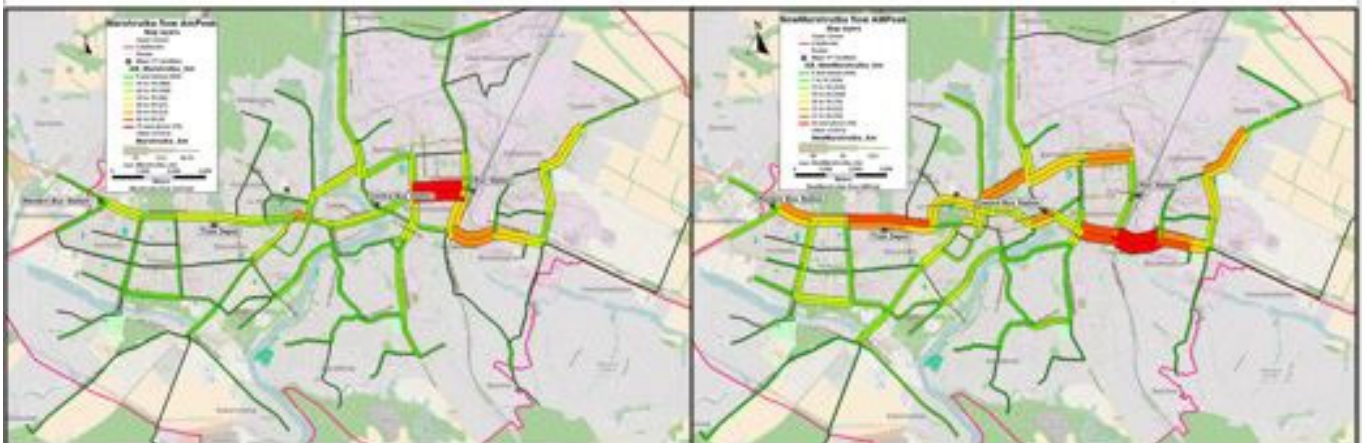
Trolley network current situation and new situation



Bus network current situation and new situation



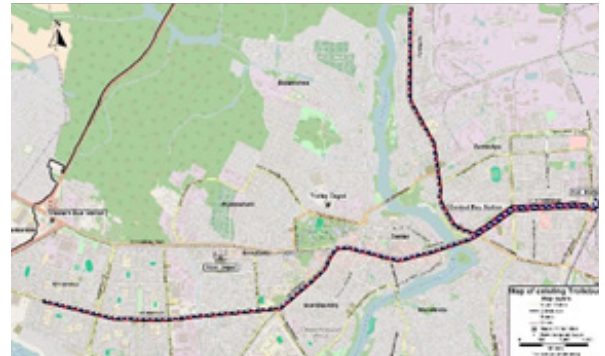
Marshrutka network current situation and new situation



6.5.2 MEASURE 5-B: RE-DESIGN PT NETWORK TO ELIMINATE OVERLAPPING SERVICE ON SAME CORRIDOR (EXAMPLE LINE 5 TROLLEYBUS AND 25 BUS LINE).

In the city there are a large number of overlapping routes, such as bus route number 25, trolleybus route 5, bus route 20, trolleybus route 6, and others. We propose to abolish overlapping routes.

PRINCIPLE: If there are overlapping trolleybus and bus routes, canceling bus routes will increase the number of departures from the trolleybus route. If there are two overlapping bus routes, then we cancel one bus route, which increase the number of trips on the other the bus route. Therefore, we will reduce the number of public transport routes without affecting service. Public transport routes should be complementary and not duplicated.

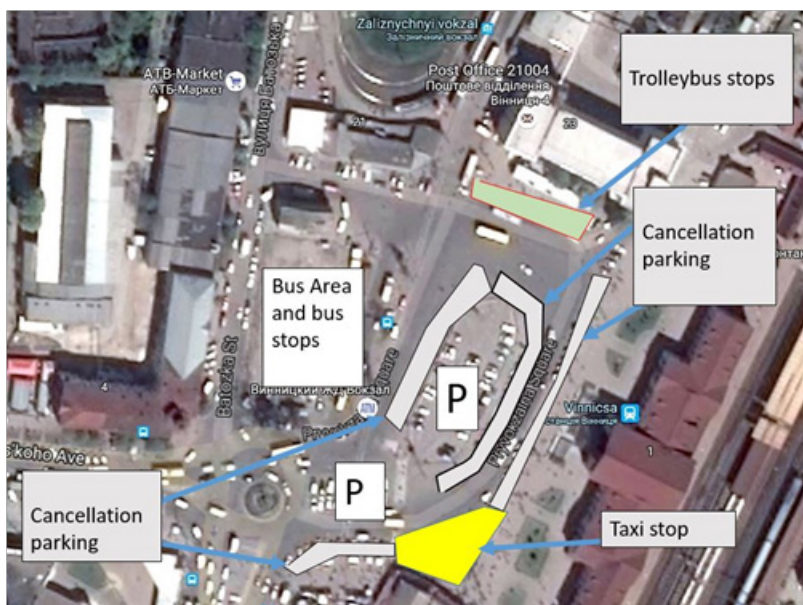


6.5.3 MEASURE 5-C: ENHANCE BUS / MARSHRUTKA SERVICE TO SUBURBS

Currently, there are few mini-buses that serve the suburbs. We intend to introduce modern and attractive bus services, operating with standard or articulated buses, bringing passengers to the city center quickly. Based on demand analysis, we intend to introduce this service in the following suburbs: Zarvantsi, Berezyna, Agronomichne, Prybuzke, Tyutky, Luka-Meleshkivska, Maidan-Chapelskui, Schitky, Havryshivka, Desna, and Stryzhavka. These bus services will have dedicated bus lanes at congested road sections. Suburban public transport service will be comprised of standard or mini buses. Upon entering the city, passengers will switch to the LRT of Vinnytsia. As a result, the city will develop transit hubs where fast and easy transfers will take place.

6.5.4 MEASURE 5-D: RE-DESIGN BUS STOP AREA IN FRONT OF THE TRAIN STATION

The train station is a central hub for all public transport in the city. A large number of routes to all parts of the city depart from there. Also, the train station is a major interchange hub of the city, providing transfers from the train to other cities and suburbs via suburban routes of buses and minibuses. In order for the transport hub to work a full capacity, it is necessary to be redesigned.



First, ensure that the location of stops are easily located for all passengers. Second, ensure that private transport does not arrive or park in close proximity to the train station, especially at public transport stops. It is necessary to make the adjacent busways exclusively for public transport use. Third, parking spaces must be created exclusively for official taxis, so they do not interfere with the passage of the city public transport and do not cause congestion.

6.6 POLICY 6: MODALITY INTEGRATION AND SYNCHRONIZATION

6.6.1 MEASURE 6-A: BUILD CENTRAL BUS STOPS (HUB) AT CITY CENTER (3 STOPS) [LIKE PYROHOVA-UROZHAY]

The Vinnytsia public transport scheme is based on four layers of operation as defined above. To operate in coordination, the city needs to invest in transfer hubs where passengers can switch from one mode to another within a short walking distance. A CHIC TO CHIC concept needs to be better applied in Vinnytsia to enable passengers to alight one mode and board another, as depicted in the following example taken from Toronto, Canada.



6.6.2 MEASURE 6-B: RENUMBER ROUTES TO HAVE UNIQUE NUMBER AND UNIQUE IDENTIFICATION PER MODE.

As part of the transformation of a unified system, we propose to provide a unique number for each line, regardless of the vehicles it uses. To distinguish the different modes, the city can brand each mode with a unique logo and unique color.

The following example is taken from Seoul, Korea, where different bus routes are labeled differently and marked uniquely to enable passengers to distinguish between their types.



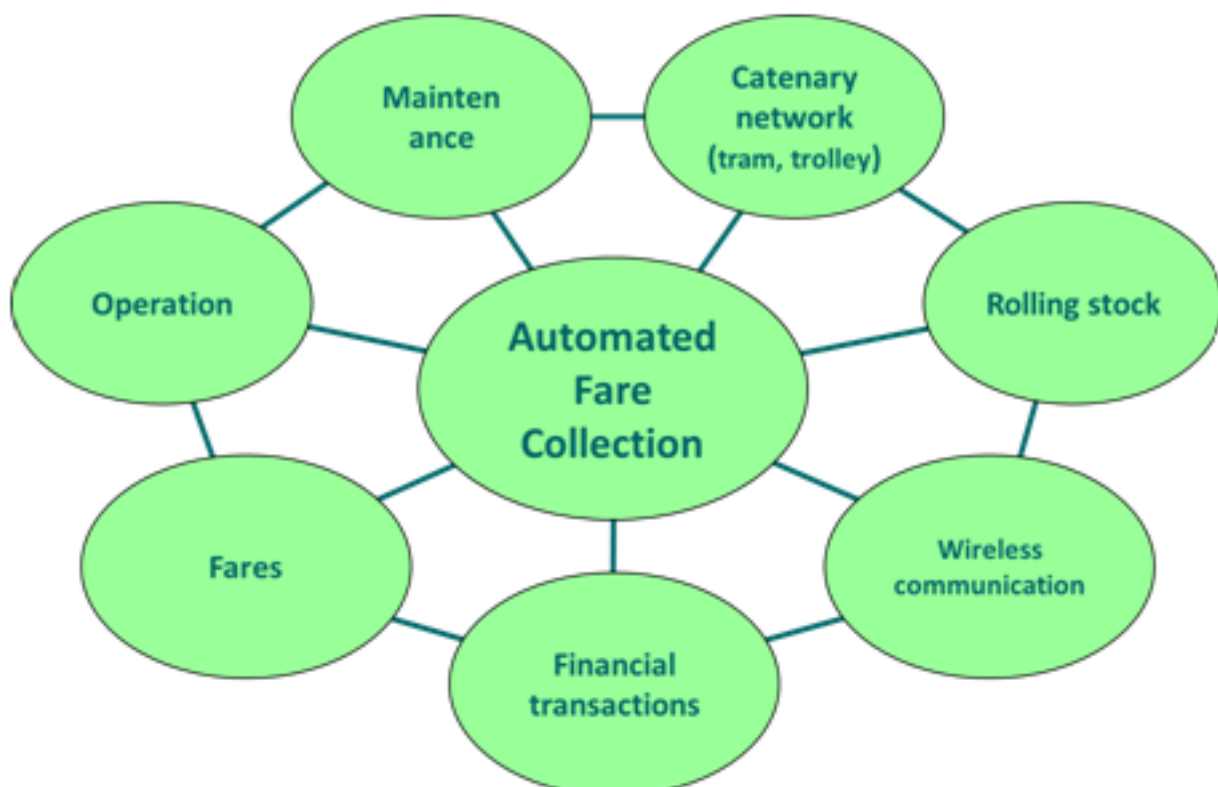
6.6.3 MEASURE 6-C: INTEGRATE TICKETING INTO A UNIFIED ELECTRONIC SYSTEM FOR ALL PT MODES

The city will implement a Unified-Integrated-Electronic ticketing system that will provide the following benefits:



1. Passengers will be charged once for OD trips, regardless of transfer;
2. Enable the city to manage the system better and operate MRT on major corridor and feeder lines to suburban destinations;
3. Reduce fare evasion and enable smooth monitoring on actual revenue and passenger flow;
4. Ensure all qualified riders receive designated discounts.

The following diagram shows the different cornerstone of such system:

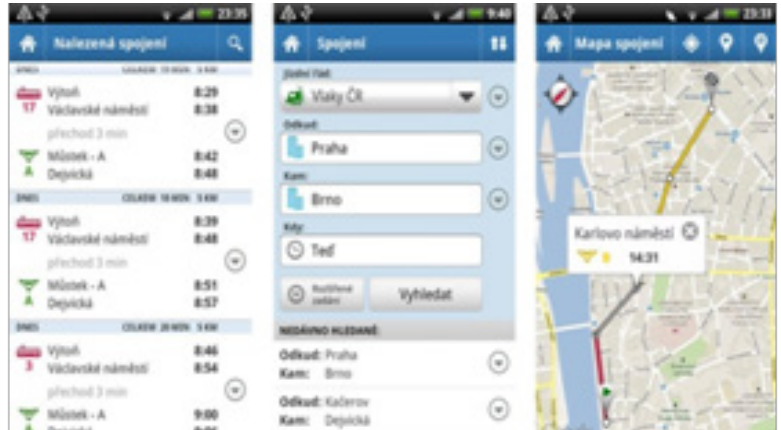


6.6.4 MEASURE 6-D: INTRODUCE STATIC INFORMATION (MAPS, SCHEDULING) AT PT STOPS

All passengers will be able to get real time information at each stop to know, when the next vehicle will arrive at the station, as well as also information about the availability and real-time schedule of all other public transport modes that serve the station.

Real-time information will be available further on the internet as well. Several smartphone applications will allow passengers to plan their trip and know when they should travel to their station.

Information about the route will also be available on-board vehicles. Electronic signs will display the direction of travel and the name of the next station. This information will also be announced audibly through a modern audio system to allow vision-impaired people to use the system. All stops will be provided with information about routes serving the stop, time-tables, and a route map.



6.6.5 MEASURE 6-E: HARMONIZE LOCATION OF PT STOPS (ESPECIALLY TRAM<-->TROLLEYBUS AND TRAM <-->BUS)

We propose to carefully analyze the location of the stops and consider minor shifts in order to better harmonize the space, as depicted in the following example.



6.6.6 MEASURE 6-F: CONSTRUCT PARK AND RIDE FACILITIES

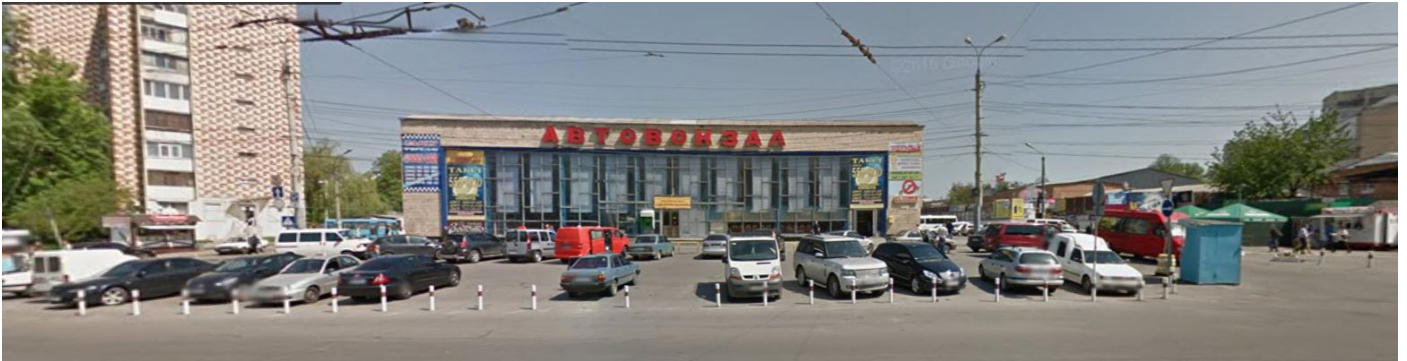
Rada plans to introduce several new P&R parking lots near main tram terminal stations. Parking in these lots will be free of charge and will encourage car owners to switch smoothly to tram lines and reach destination without the need to consider parking time search and cost.



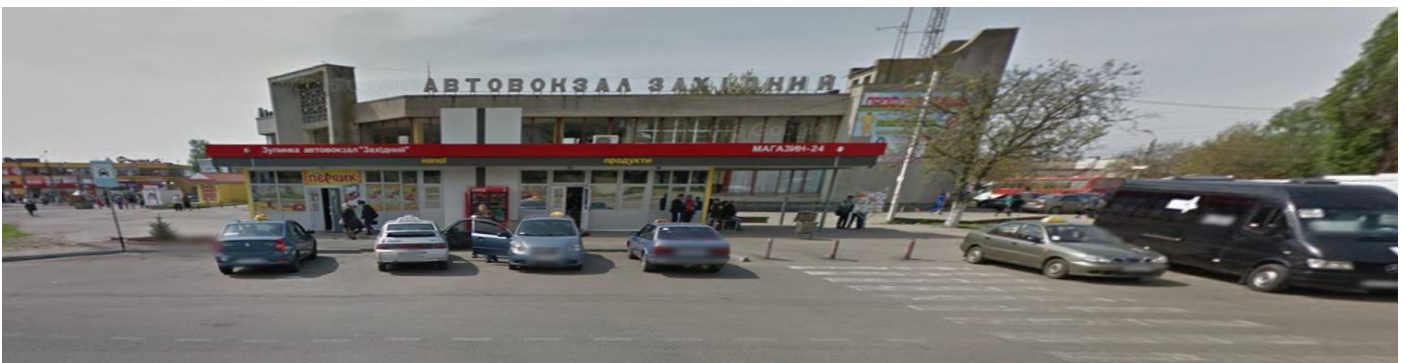
6.6.6 MEASURE 6-F: CONSTRUCT PARK AND RIDE FACILITIES

We believe that it is necessary to ensure the major bus stations serve as a large interchange point. It is necessary to provide passengers with a convenient and secure interchange point between the buses. This concept applies to both major bus stations.

Central bus station:



Western bus station:



6.6.8 MEASURE 6-H: INTEGRATE PT WITH CYCLING BY OFFERING BOARDING BICYCLE ON TRAM, DESIGNATED BIKE PARKS AND CYCLING PATH TO MAJOR STOPS

We believe is useful to implement bike sharing in the city by constructing bike rental stations at the central bus stations of the city. Paid bicycle rentals can be in the same terminal that sells tickets for public transport. Rental stations and bicycle returns must be placed in close proximity to the central city stops in the streets of Soborna, Kotsyubinskogo, and Pyrohova.



6.7 POLICY 7: ITS

6.7.1 MEASURE 7-A: ENFORCE CAR TRAFFIC ALONG SOBORNA STREET WITH SPECIAL LPR CAMERAS

In order to enable full PT priority along Soborna street, the city will need to deploy special LPR cameras that capture vehicle license plate, and in cases license is not authorized give an automatic fine to the driver via courier. Exemption will include authorized PT vehicle, emergency and rescue vehicles as well as special VIP vehicle that the city will decide.



6.7.2 MEASURE 7-B: INTRODUCE INTEGRATED ELECTRONIC TICKETING SYSTEM FOR ALL 4 PT MODES (STAGE A: TRAM, TB AND BUS) WITH SMART PHONE (NFC) TECHNOLOGY FOR CHARGING / VALIDATING

We offer to design a unified system of tickets to all kinds of public transport including buses. A single ticket system should be designed to all for transfers between all modes of public transport, and should be well modulated and debugged for continuous operation, both within the city and in the suburbs. Purchasing an e-ticket must be possible on all public transport stops, at news kiosks, or via mobile apps, giving an alternate, faster, and more efficient method of purchasing e-tickets on public transport the in Vinnytsia

6.7.3 MEASURE 7-C: DEVELOP PUBLIC TRANSPORT MANAGEMENT SYSTEM TO MONITOR /REGULATE PT AND TO FACILITATE REAL TIME PASSENGER INFORMATION (INCLUDING GPS ON ALL PT VEHICLES)

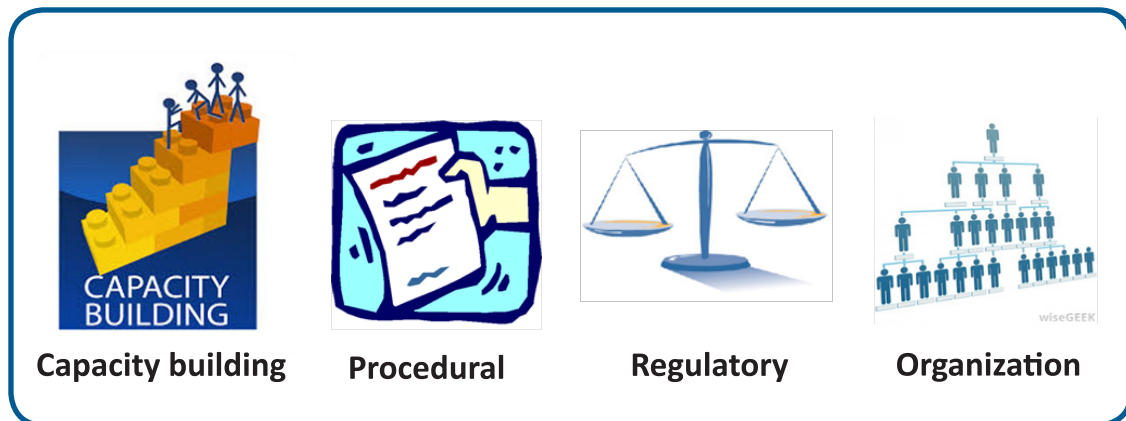
We think that it is necessary to install a navigation system on all public transport vehicles operating in the city. This will provide features such as tracking the movement of the vehicle, the determination of its exact location, counting the distance covered, and monitoring the vehicle speed on each leg. This data is very important for the further design of the city transport network for passengers. This data can be displayed on a specially installed electronic board showing the estimated travel time of the route, any delays in the route, or offer an alternative route for passengers. All of the above are a significant improvement of the quality of public transport services of Vinnytsia.

6.7.4 MEASURE 7-D: INTRODUCE REAL TIME INFORMATION (SIGNS AT STOPS, DATA FOR SMARTPHONE APPS.) WITH INTEGRATED SCHEDULING FOR ALL 4 PT MODES

We believe that the official website of the Department of public transport is necessary to display all the movement of public transport in the city, schedule online which will completely replace the existing interval schedule, thereby greatly improving the level of passenger service by going to the next level in terms of technology services. All bus stops will be displayed in the online mode, the arrival time of the next form of public transport, as well for the convenience of passengers in the online schedule can go through your mobile device, its own smartphone and in it to track all public transport routes of the city of Vinnytsia.

7 MECHANISM OF REALIZATION OF THE STRATEGIES

Rada intends to reform the current organization and focus on sustainable transport development. The main purpose of this reform is to obtain full integration in the activities of all relevant stakeholders toward the implementation of the strategy. All of the measures set above will be optimally implemented once institutional, organizational, and regulatory improvements will be introduced.



To this end, we identified 11 major actions that will be taken in the near future:

Action 1: Establish a Public Transport Holdings Company



Public transport will be better planned and more professionally regulated upon the establishment of a public transport authority (or holdings company). Such a body will be responsible for all aspects of PT service provision, including but not limited to:

- Plan public transport route schemes for bus, trolleybus, and tram;
- Tender operations of PT lines to the private sector through public service contracts;
- Supervise operations and enforce penalties if operation public service contracts are not met;
- Serve as a focal body for system integration (ticketing and information);
- Assume responsibility for maintenance of PT facilities (such as bus stops and terminals);
- Operate and update all common integrated facilities, such as the integrated ticketing system and the integrated public information system;
- Address public complaints;
- Promote a targeted, coordinated and comprehensive approach to improve deficits in transit vehicle operator resources.

Rada will claim responsibility for all PT lines that operate from/to the city, and will ensure adequate service is provided to nearby suburbs.

Action 2: Establish transportation planning team



Rada will establish a professional transportation planning team that will be able to support strategic decision making. The team will be cooperating with various departments in Rada, including those responsible for the economy, roads, PT, environment, law enforcement, and architecture. The team will maintain and update the newly developed travel demand model, routinely execute transportation surveys, propose new transportation scenarios and alternatives, appraise their benefits, provide preliminary cost-benefit analysis to all kinds of projects, and complete revenue and ridership estimations for different transport options. The planning team will become the most professional body in Vinnytsia, and will transfer knowledge to universities as well as to other stakeholders in Rada.

Action 3: Establish Traffic Management department



Rada will establish a traffic management department which will claim responsibility over all traffic activities in the city. The primary role of this department will be to control traffic lights and manage daily car traffic. In addition, the department will be responsible for different engineering solutions such as one-way traffic, bus lanes, intersection layout changes, and the introduction of bus lanes. The department will also be responsible for regulating taxi operations.

Action 4: Establish parking organization



Rada will establish a parking department which will be responsible over all parking matters in the city. Its prime goal will be to implement our parking strategy to introduce the paid parking scheme in the city, enforce it, prepare monitoring programs, and guarantee that new tailor-made parking spaces are created with the implementation of new building plans that increase the parking demand. The department will also deal with parking revenue collection for Rada.

Furthermore, the Department will be responsible for communication with the population regarding the application for permits and promotion of the general policy objectives.

Action 5: Establish cycling roundtable panel



Rada will form an advocacy panel composed of different officials and other stakeholders. The main objective of this panel will be to plan and promote cycling and coordinate ambitious cycling infrastructure plans within different entities. The group will monitor the progress of relevant departments in achieving cycling goals and will report periodically to the mayor.

The round table will coordinate with NGOs, cycling activists, international experts, the private sector, public transport operators, and the media.

Action 6: Introduce public service contract



The city will define a clear and comprehensive mechanism for Rada to work with public transport operators. Such a contract will define mutual obligations and the rights of both sides, ensuring passengers are provided with a satisfactory level of service. In practice, all public transport service will be offered to operators for a period of 6-10 years. Contracts with obligations (Service Level Agreement, SLA) and rights (compensation, subsidy) of operators will clearly define an enforcement and penalty mechanism.

Other Public-Private-Partnerships (PPP), such as for parking operations and the electronic ticketing system, will also be based on a public service contract.

Action 7: Ongoing training and engagement of international experts



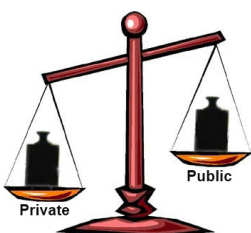
Rada will define the annual training work plan that will involve all professionals and officials dealing with transportation matters from Rada and from the private sector engaged by Rada (such as bus drivers). The main objective is to develop a high level of local expertise in a wide range of transportation functions (such as planning, operation, design, procurement, legal, organizational, etc.). In order for this to be fulfilled, Rada will seek ongoing assistance from international experts. Capacity building and knowledge transfer will be a strategic task of all involved.

Action 8: Cost-Benefit Analysis investments



Rada will define a clear mechanism for evaluating project feasibility that will meet international standards and will be accepted by the international committee. A standard cost-benefit analysis will be completed for each large infrastructure project. This will enable the city to justify and prioritize projects, spend the budget more effectively, and attract financing agencies, if needed.

Action 9: : Engage private sector in project financing



In order to fulfil our vision, Rada intends to invest a significant amount of money in the next coming years to leverage the transit system from the Soviet period to EU standards and beyond. This requires significant budget allocation which might not be always available within our local or national budget. Given the more transparent project evaluation process mentioned above, Rada will engage the private sector in large projects such as new highways, Tram, or the installation of technology systems. This will enable us to simultaneously invest in multiple projects while ensuring the cash flow does not run dry and the project is financially stable.

Action 10: Regulatory change to enable BOT projects



As Rada might consider implementing some of its large projects with the private sector through a BOT (Build-Operate-Transfer) mechanism, we will need to make legal adjustments to support it. Such changes include the ability of the private sector to collect revenue and to issue penalties on violators.

Action 11: Transparency planning process and public participation



The city will move to transparent planning processes where planning alternative will be available to all people online. Access to all information will be available to the public. In addition, the city will execute public hearing sessions in early planning stages to receive feedback from residents and refine planning, if needed.

8 IMPACT OF PUBLIC TRANSPORT STRATEGY

8.1

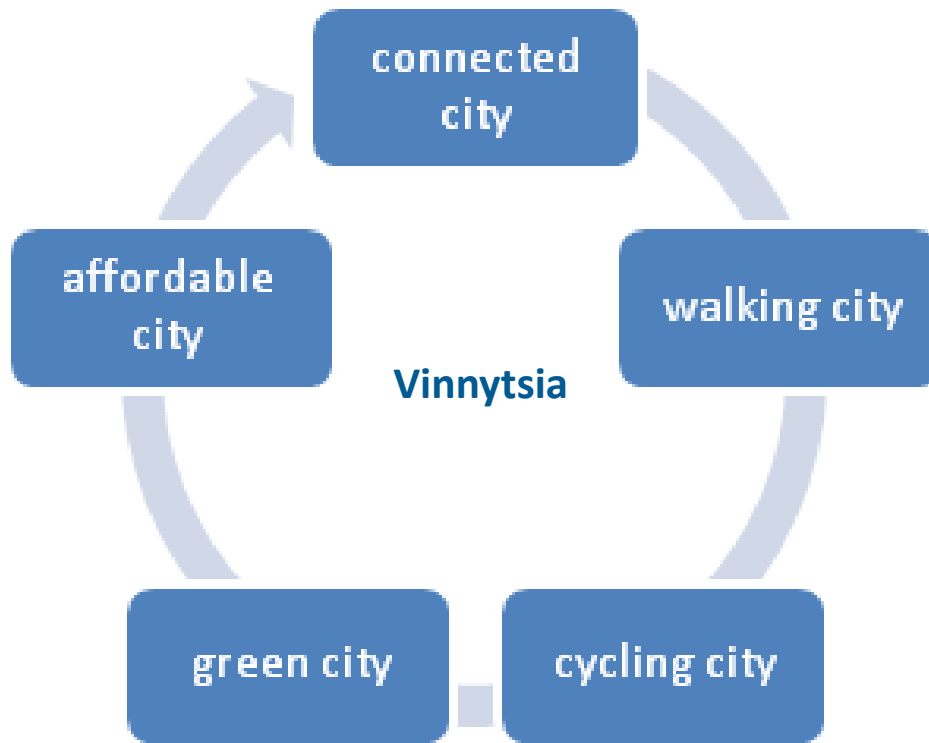
MAJOR TRANSPORTATION INDICATORS OF THE SUSTAINABLE TRANSPORT SCENARIO

The result of the new sustainable transport strategy is that by 2030, Vinnytsia will provide its residents with a higher quality of life. Vinnytsia will be a connected city in which most residents will be able to walk a short distance to the nearest LRT station and travel quickly and safely to their destination along lanes dedicated to public transport, seamlessly using a single and affordable transit ticket. Alternatively, residents and visitors will be able to cycle to their destination using their own bicycle and park it at their destination, or take one of the many shared bikes that will be located at bike-share stations throughout the city.

The city will be greener, with much cleaner air, and will contribute positively to the economic growth of Ukraine.

The following table shows the expected quantitative impacts of the sustainable urban transport strategy (SUT), compared to a scenario in which the city continues along the same path, known as the BAU scenario.

TARGET		STATUS 2016	NO INTERVENTION 2030	SUT 2030 TARGET
Share of sustainable modes		55%	48%	60%
Share of electric transport passengers from PT		63%	55%	73%
Average public transport speed (km/h)		18.2	15.2	19.1
Integration	Fare	Limited	Limited	FULL
	Schedule	No	No	FULL
	Info	No	Limited	FULL



The table above shows that the proposed strategy will turn Vinnytsia into a:

8.2 GREEN TRANSPORT CITY

By 2030, over 60% of all trips in the city will be completed using sustainable modes, out of which 73% will be electric.

Our strategy will also reduce the number of kilometers travelled by car by up to 10%

8.3 DYNAMIC CITY

The development of new Tram lines will enable the city to further develop and transform into a dynamic urban area with excellent accessibility for all people and all purposes. The new Tram and Trolleybus, accompanied with complementary bus and marshrutka services will play a major role in the economic development of the city, and will assist in attracting national and international investments.

In addition, the livelihood of the city center and the creation of a walkable and green-oriented city will improve quality of life for residents and tourists alike, and further add to the attractiveness of the city.

8.4 MOVING CITY

By providing a reliable, attractive, accessible, and affordable PT system, people will shift from driving cars and taking taxis to greener modes, thus congestion will be relieved significantly. It is predicted that travel time by car will be reduced; while AM peak car speed will increase from 15 km/h to over 18 km/h. Passengers on public transport modes will enjoy even higher speeds than car drivers. Overall passengers will save approximately if our strategy will be implemented.

8.5 AFFORDABLE CITY

Increasing PT usage by over 20% will enable us to provide more frequent and cheaper PT service for all. System integration will enable all users to reach destinations with less than 20 US cents, regardless of destination or time of travel. For commuters, students, and elderly people, PT will be even cheaper. In addition, people will enjoy cycling free of charge (or at minimal cost if using our bike-sharing scheme). Most importantly, over 25% of our residents will give up driving their cars in the city center. In other words, over 50,000 families will save considerable amounts of money due to our strategy.

8.6 ACCESSIBLE CITY

By 2030, more than half of the residents of Vinnytsia and over 60% of its employees will be living next to a TRAM stop. People will be able to switch between modes quickly and reach different parts of the city faster than ever before, and without the need to drive a car.

9 ACTION PLAN

Policy	Project	Description	Responsible agency	Planning/ Construction year	Operational year	Estimated budget (M Euros)
1. Tramway rehabilitation	New section on Kotsyubunskogo	Expand tram network by constructing new section on Kotsyubunskogo (1.20 KM) and re-align two lines	Road Department	2017-2019	2020	5
	Modernize Tram Fleet	Modernize Tram Fleet including level boarding rolling stock (74 rolling stocks)	PT Department	2017-2029	2030	22.2
	Modernize tram stations	Modernize tram stations into accessible low floor stops with ITS	PT Department	2017-2019	2020	4
	Signal prioritization	Introduce signal prioritization at intersections with significant Tram service (>10 per hour).	PT Department	2018-2020	2021	2
	Add another stop on Soborna	Add another stop on Soborna west of bridge	PT Department	2018	2019	0.3
	Rehabilitate the electrical system	Rehabilitate the electrical system, including overhead wires, substations, etc.	Electric Department	2017-2022	2023	13
	Extend Trolleybus to Bazotka	Extend Trolleybus to Bazotka (2.3 KM)	Electric Department	2017-2019	2020	0.46
2. Trolleybus rehabilitation	Extend Trolleybus to Nemyrovske	Extend Trolleybus to Nemyrovske (2 KM)	Electric Department	2017-2019	2020	0.4
	Extend Trolleybus to T0216	Extend Trolleybus to T0216 (2 km)	Electric Department	2017-2019	2020	0.4
	Extend Trolleybus to Sheptytsky	Extend Trolleybus to Sheptytsky (3.5 km)	Electric Department	2017-2019	2020	0.7
	Construct Trolleybus lanes at Kotsyubinskogo	Construct Trolleybus lanes at bul. Kotsyubinskogo (1 KM)	Road Department	2020-2021	2022	0.3

9 ACTION PLAN

Policy	Project	Description	Responsible agency	Planning/ Construction year	Operational year	Estimated budget (M Euros)
2. Trolleybus rehabilitation	Construct Trolleybus lanes at Kyivska	Construct Trolleybus lanes at Kyivska (2.5 KM)	Road Department	2018-2019	2020	0.75
	Construct Trolleybus lanes at Pyrohova central	Construct Trolleybus lanes at Pyrohova central (0.45 KM)	Road Department	2018-2019	2020	0.2
	Real time passenger information system at TB stops	Introduce real time passenger information system at TB stops	PT Department	2018-2019	2020	1.4
	Signal prioritization	Introduce signal prioritization at intersections with significant Trolleybus service (22 intersections)	PT Department	2018-2020	2021	2.5
	Modernize Trolleybus fleet	Modernize Trolleybus fleet and purchase more to operate in new sections (132 rolling stocks)	PT Department	2017-2029	2030	19.8
	Rehabilitate lanes with new asphalt	Rehabilitate lanes with new asphalt on major trolleybus corridor	Road Department	2017-2018	2019	3
	Modernize bus fleet	Modernize bus fleet (all low floor), total 50 buses.	PT Department	2017-2029	2030	7.5
3. Bus service	Construct new bus stops	Construct new bus stops at districts (approximately 20 bus stops)	PT Department	2017-2020	2021	2
	Rehabilitate bus depots	Rehabilitate bus depots.	PT Department	2017-2022	2023	4
	Re-arrange traffic circulation on south bridge	Re-arrange traffic circulation on south bridge intersection including bus priority lane on bridge, add pedestrian bridge	Road Department	2017	2018	0.5

9 ACTION PLAN

Policy	Project	Description	Responsible agency	Planning/Construction year	Operational year	Estimated budget (M Euros)
4. Marshrutka service	Realign Marshrutka lines to operate	Realign Marshrutka lines to operate at designated feeder and suburban lines	PT Department	2017-2019	2020	0.5
	Consolidate operators under few PSC	Consolidate operators under few PSC, each per route or bundle of routes	PT Department	2017-2019	2020	-
	Integrate with PT	Integrate with PT including designated subsidy (ticketing, schedule, stops, information)	PT Department	2017-2019	2020	
	Modernize fleet	Modernize fleet and consider purchasing electric vehicles	PT Department	2017-2029	2030	3
5. Optimize PT scheme	Rationalization of existing PT network	Define hierarchical network with suitable Level of service per layer. Re-design PT network to eliminate overlapping service on same corridor (example line 5 trolleybus and 25 bus line). Enhance bus/Marshrutka network to suburbs.	PT Department	2017-2020	2021	0
	Re-Design bus stop area in front of the train station	Re-Design bus stop area in front of the train station	PT Department	2017-2020	2021	1
6. Modality integration and synchronization	Build central bus stops (hub)	Build central bus stops (hub) at city center (3 stops)	PT Department	2017-2020	2021	2
	Renumber PT routes	Renumber routes to have unique number and unique identification per mode	PT Department	2017-2020	2021	0
	Static information at PT stops	Introduce static information (maps, scheduling) at PT stops	PT Department	2017-2020	2021	1

9 ACTION PLAN

Policy	Project	Description	Responsible agency	Planning/ Construction year	Operational year	Estimated budget (M Euros)
6. Modality integration and synchronization	Harmonize location of PT stops	Harmonize location of PT stops (especially Tram<-->Trolleybus and Tram <-->Bus	PT Department	2017-2020	2021	0
	Park and Ride facilities	Construct 2-4 Park and Ride facilities on entries main roads.	Road Department	2017-2020	2021	2
	Re-design space in front Autovokzal on Kyivska	Re-design space in front Autovokzal on Kyivska and West Autovokzal to enable easy transfer	PT Department	2017-2020	2021	1
	Re-design space in front West Autovokzal	Re-design space in front Autovokzal on Kyivska and West Autovokzal to enable easy transfer	PT Department	2017-2020	2021	1
	Integrate PT with cycling by offering boarding bicycle on Tram	Integrate PT with cycling by offering boarding bicycle on Tram, designated bike parks and cycling path to major stops	PT Department	2017-2020	2021	0.4
7. ITS	Enforce car traffic along Soborna str. with special LPR cameras	Enforce car traffic along Soborna str. with special LPR cameras	PT Department	2017-2020	2021	0.8
	Integrated Electronic ticketing system	Introduce Integrated Electronic ticketing system for all 4 PT modes (stage A: Tram, TB and Bus) with smart phone (NFC) technology for charging / validating	PT Department	2017-2020	2021	5

9 ACTION PLAN

Policy	Project	Description	Responsible agency	Planning/ Construction year	Operational year	Estimated budget (M Euros)
7. ITS	Develop Public Transport management system to monitor	Develop Public Transport management system to monitor /regulate PT and to facilitate real time passenger information (including GPS on all PT vehicles)	PT Department	2017-2020	2021	2
	Real time information	Introduce real time information (signs at stops, data for smartphone apps.) with integrated scheduling for all 4 PT modes	PT Department	2017-2020	2021	2
Action plan	Description				Responsible agency	Operational year
Planning and modeling Department	Establish planning and modeling in-house team to appraise benefit of different project and assist decision makers in project evaluation				P.T Department	2017
Traffic management department	Establish traffic management department within PT holding that will be in charge of traffic flow, signals and traffic lights and other traffic related aspects				P.T Department	2017
Parking organization	Establish parking department who will plan, manage, legalize, develop, regulate, and enforce parking issues in the city				P.T Department	2016
Public Service Contract	PSC will become a standard and will define mutual obligations and rights of operators and regulator (the city)				P.T Department	From 2016
Traffic Impact assessment	Standardize a mechanism to appraise the traffic impact of new large scale development project and propose mitigation to negative impacts.				Planning & Modeling	2017

10 SHORTTERM INVESTMENT / PILOT PROJECTS: 2017-2020

The implementation of the Sustainable transport strategy involves a variety of physical and institutional measures. The following section describes the action plan that Rada will implement in the next 4 years (2016-2020).

Pilot	Actions	Opening year	Involved Agency	Institutional amendments
New Tramway section on Kotsyubinskogo	1. Planning (2017)	2020	PT Department	• Public Service Contract
	2. Detailed design (2017-8)		Road Department	• Articulated tramway tender
	3. Construction of Infrastructure (2018-9)		Electric Department	• Procurement of ITS
	4. ITS Update (2019)		T.M Department	
Modernize tram stations	1. Planning (2017)	2020	PT Department	• Public Service Contract
	2. Detailed design (2017-8)		Road Department	• Articulated station tender
	3. Construction of Infrastructure (2018-9)		Electric Department	• Procurement of ITS
	4. ITS Update (2019)		T.M Department	
Add another stop on Soborna	1. Planning (2017)	2020	PT Department	• Public Service Contract
	2. Detailed design (2017-8)		Road Department	• Articulated station tender
	3. Construction of Infrastructure (2018-9)		Electric Department	• Procurement of ITS
	4. ITS Update (2019)		T.M Department	

10 SHORT TERM INVESTMENT / PILOT PROJECTS: 2017-2020

Pilot	Actions	Opening year	Involved Agency	Institutional amendments
Trolleybus Lane on Kotsyubinskogo	1. Planning (2017)	2020	PT Department	• Procurement of ITS
	2. Construction of Infrastructure (2017-8)		Road Department	
	3. Parking re-location (2018-9)		T.M Department	• Design tender of bus stop
	4. Bus stop & ITS (2019)			
Trolleybus Lane on Kyivska	1. Planning (2017)	2020	PT Department	• Procurement of ITS
	2. Construction of Infrastructure (2017-8)		Road Department	
	3. Parking re-location (2018-9)		T.M Department	• Design tender of bus stop
	4. Bus stop & ITS (2019)			
Trolleybus Lane on Pyrohova	1. Planning (2017)	2020	PT Department	• Procurement of ITS
	2. Construction of Infrastructure (2017-8)		Road Department	
	3. Parking re-location (2018-9)		T.M Department	• Design tender of bus stop
	4. Bus stop & ITS (2019)			
New Trolleybus section T0216 (2km)	1. Planning (2017)	2020	PT Department	• Procurement of ITS
	2. Detailed design (2017-8)		Road Department	
	3. Construction of Infrastructure (2018-9)		Electric Department	• Design tender of bus stop
	4. ITS Update (2019)		T.M Department	

10 SHORT TERM INVESTMENT / PILOT PROJECTS: 2017-2020

Pilot	Actions	Opening year	Involved Agency	Institutional amendments
New Trolleybus section Andrey Sheptytsky str. (3.5 km)	1. Planning (2017)	2020	PT Department	<ul style="list-style-type: none"> Procurement of ITS
	2. Detailed design (2017-8)		Road Department	
	3. Construction of Infrastructure (2018-9)		Electric Department	<ul style="list-style-type: none"> Design tender of bus stop
	4. ITS Update (2019)		T.M Department	
New Trolleybus section Nemyrovske road (2 km)	1. Planning (2017)	2020	PT Department	<ul style="list-style-type: none"> Procurement of ITS
	2. Detailed design (2017-8)		Road Department	
	3. Construction of Infrastructure (2018-9)		Electric Department	<ul style="list-style-type: none"> Design tender of bus stop
	4. ITS Update (2019)		T.M Department	
New Trolleybus section Bazotka – Lypovetska (2.4 km)	1. Planning (2017)	2020	PT Department	<ul style="list-style-type: none"> Procurement of ITS
	2. Detailed design (2017-8)		Road Department	
	3. Construction of Infrastructure (2018-9)		Electric Department	<ul style="list-style-type: none"> Design tender of bus stop
	4. ITS Update (2019)		T.M Department	
Passenger information system	1. Preliminary planning and technology spec (2017)	2020	PT Department	Procurement of system
	2. Installation of Electricity and communication (2017-8)		T.M Department	
	3. ITS tender (2018)			
	4. Installation of ITS (2019)			
Rehabilitate lanes with new asphalt	1. Planning (2017)	2019	PT Department	<ul style="list-style-type: none"> Public Service Contract
	2. Detailed design (2017-8)		Road Department	
	3. Construction of Infrastructure (2018)			<ul style="list-style-type: none"> Procurement of ITS
	4. ITS Update (2018)		T.M Department	

10 SHORT TERM INVESTMENT / PILOT PROJECTS: 2017-2020

Pilot	Actions	Opening year	Involved Agency	Institutional amendments
Re-arrange traffic circulation on south bridge	1. Planning (2017)	2018	PT Department	<ul style="list-style-type: none"> Public Service Contract
	2. Detailed design (2017)		Road Department	
	3. Construction of Infrastructure (2017)		T.M Department	<ul style="list-style-type: none"> Procurement of ITS
	4. ITS Update (2017)			
Realign Marshrutka lines to operate	1. Planning (2017)	2020		<ul style="list-style-type: none"> Public Service contract
	2. More Driver (2014)		PT Department	
	3. ITS Update (2017)		T.M Dept.	
Consolidate operators under few PSC	1. Planning (2017)	2020		<ul style="list-style-type: none"> Public Service contract
	2. More Driver (2014)		PT Department	
	3. ITS Update (2017)		T.M Dept.	
Integrate with PT	1. Planning (2017)	2020		<ul style="list-style-type: none"> Public Service contract
	2. More Driver (2018)		PT Department	
	3. ITS Update (2019)		T.M Dept.	
Modernize fleet	1. Planning (2014)	2020		<ul style="list-style-type: none"> Public Service contract
	2. More Driver (2014)		PT Department	
			T.M Dept.	

11 CLOSING REMARKS

The future of our city is bright. The great enthusiasm of our people to contribute to the city will inevitably transform Vinnytsia into a better place to live in. The dynamic of our nation and the skills of our great people will ensure that the city keeps on developing and transforming into a leading international metropolitan. Our unique setting and culture diversity will ensure tourism will keep on growing in rapid pace.

Challenges are significant and risky but will be all mitigated if we join force and embrace a new path for our city. Goals and objectives of our plan set high but will be achieved in hard work.

One of the key principles of our ambitious plan is integration. We must ensure our plan is coherent and different parts are communicating between each other. One can't expect passengers to go on buses, if service is not reliable and synchronized. We cannot expect people to get rid of their car unless a better solution is provided.

Integration will be achieved in the following aspects:

1. Between urban and transport: Rada will ensure urban development and transportation are synchronized and expanded based mutual principles and shared strategy.
2. Between modes of transport: Our plan will make sure passenger can enjoy alternative modes of transport to travel with, and transfer from one more to another easily.
3. Between department in Rada: All relevant departments within Rada will be working closely to make sure transportation system is implemented according to our plan.
4. Within the same mode of transport: Public transport will act as a synchronized system with smooth interfaces between lines. Car traffic will also be managed in a harmonic manner
5. Between the vehicles and the people: In the end, Rada is committed to provide mobility to its people, not its vehicles. Therefore, people will enjoy engineering and technological solutions that will provide improved level of service.
6. Integration with our surrounding: Vinnytsia city will keep its strategic position as the central city of the region and will hence provide high-class integration to commuters, long distance national, and international travelers and commodities
7. Integration with our environment: Our plan will ensure that we keep protecting our environment and live side by side in our wonderful nature setup

OUR VISION SUMMARIZES IT ALL:

In 2030, the citizens of Vinnytsia will enjoy a transport system that is integrated, sustainable, and safe, with high-quality services for the entire population. The transport system will contribute to the city's economic development while limiting its environmental footprint.