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**MOVE
IT LIKE** Lublin
CHISINAU Transport Development Initiative

REPORT

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Assignment: Analysis of the technical, financial and administrative aspects of the merger of the municipal enterprises "Urban Bus Park" and "Regia Transport Electric"

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EXECUTIVE SUMMARY

Simultaneous existence of two operators for public transport in Chisinau, Chisinau Electric Transport Authority and Urban Bus Park, both owned by the Chisinau Municipal Council, under the executive subordination of Chisinau City Hall and benefiting from the same public subsidy mechanism to compensate for tariff differences proved to be counterproductive operationally, financially and in relation to travel. Identical institutional and funding conditions preclude any idea of competition, and different transport tickets and fares, as well as the rational non-correlation of routes, are major difficulties for passengers.

Fare policy is inadequate to the structure of passengers and their travel needs. Moreover, the revenues from revenues are abnormally low, not even covering the salary chapter from the operating budgets. The situation is due to the inadequacy of the basic tariff to the current economic reality, the last adjustment being made over 12 years ago. The result is increasing pressure on the local budget, unsustainable in the medium and long term.

It should be emphasized that institutional separation, operational non-coordination, the characteristics of the tariff offer and the degree of subsidy from the local budget are completely outside the good European practice in this field.

The study identified two sources, immediately accessible, for improving the financial situation, simultaneously with increasing the quality of public transport, through its components of fare offer and operational integration: on the one hand, increasing the basic fare and re-balancing the fare in favor of loyal passengers, on the other hand, the abolition of redundant bus routes in the suburbs and the limitation of others on the urban route to inter-modal stations with trolleybuses. The application of a basic tariff of 6 lei and a monthly urban subscription of 160 lei could lead to an increase in revenues of approx. 60-70%. At the same time, giving up 4 bus routes and shortening another 5 will reduce the bus fleet by approx. 14.5%. The successful application of these measures is conditioned, or at least greatly facilitated, by the institutional merger of the two public operators. The success of some projects absolutely necessary for the future improvement of the public transport service is conditioned by the same institutional reform: the Automatic Charging System and the Traffic Management System.

In the second part of the Study are presented the main financial parameters of the two operators, with comments on the performances and the differences noticed. Apart from the subsidy percentage, the apparently acceptable situation is largely due to the protected economic environment in which the two operators operate, having the “umbrella” and the guarantee of the local budget. Even if public transport is considered an essential social service, which is why the laws of a liberalized market apply with the mitigation imposed by the social conditions of the community, the situation can become (and we appreciate that it has become) financially un-stimulating. The application of *EC Regulation 1370/2007 of the European Parliament and of the Council on public passenger transport services by rail and road* can bring a change of perspective to operators and benefits for the financier, without sacrificing the quality parameters of the service.

The economic substantiation of the merger and its financial aspects are also presented, as well as the legal procedures and financial-accounting steps to be followed for the merger of the two operators, with arguments for the merger by absorption by RTEC.

In the financial reports included in the Study can be noticed percentages with unusually high values, which cannot be the mirror of a normal activity. This is due to the reporting of current figures to figures resulting from erroneous accounting records in previous years.

The third part of the Study presents the evaluation of human resources following the merger, starting from the current organizational structures, with the characteristics resulting from the relatively different way of vertical organization of the two operators. The estimated impact on the staff structure is presented, including the one resulting from the resignation of drivers/cashiers in favor of controllers. An organization chart is also proposed for the merged entity, also based on good practice in the field.

The conclusion of the Study is that the radical recovery of public transport financing in Chisinau and ensuring a sustainable development in which increasing the quality, attractiveness and use of this service are the most important components, requires major changes in tariff and operating policies. Continuing with two artificially institutionally separated operators is counterproductive and will make it much more difficult (or even impossible) to achieve these goals. On the contrary, the merger into a single public operator will not disturb the limited free nature of the public transport market in Chisinau and will facilitate the implementation of policies and technical projects to improve and integrate activities, under more reasonable funding conditions.

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CHAPTER I

INSTITUTIONAL AND OPERATIONAL ASPECTS

I.1. The current situation

The objective of the public transport operator in Chisinau must be to provide a transport service at quality parameters in accordance with good practices in the field, in terms of improving financial operating conditions and reducing pressure on the local budget. Achieving this goal is done through investments in infrastructure, vehicles and support systems (such as traffic management, automated charging system, or ERP - *Enterprise Resources Planning*), which involves financial resources and time, but also through measures of institutional reorganization, internal optimization and revenue growth.

The problems identified in a previous consultancy study on ¹a broader subject (2013) remain valid and have only been resolved to a small extent: the start of the purchase of new vehicles, the local legislation to remove non-standard minibuses from the system. quality, limited real-time traffic management applications and a pilot project of automatic charging system. Due to the institutional separation of operators, the last two projects are separated as an application and do not have unitary characteristics.

This chapter will present the negative effects of institutional separation on the operational performance of the public service.

Chisinau consists of Chisinau, which includes over 82% of the population, 6 cities (Codru, Cricova, Durlești, Sângera, Vadul lui Vodă and Vatra), 13 communes (Băcioi, Budești, Bubuieci, Durlești, Ciorescu, Colonița, Condița, Cruzești, Ghidighici, Grătiești, Humulești, Stăuceni, Tohatin, Trușeni, Vădulenii) and 11 villages from the

¹ Chisinau Public Transport Project Consultation program on public transport regulation and restructuring Chisinau Municipality Transport Strategy <https://docplayer.org/68025975-municipiului-chisinau.html>.

previously mentioned communes (Bâc, Brăila, Buneț, Chelutiori, Dobrogea, Dumbrava, Făurești, Frumușica, Goianul Nou, Hulboaca New Village and Straseni). Usually, this situation defines a *metropolitan area*, not a municipality, but the difference is not relevant as long as the area is treated in its entirety, at least from the point of view of public transport.

Public transport in Chisinau City and its suburbs is provided by two public operators owned by the Chisinau Municipal Council and under the executive subordination of Chisinau City Hall - Electric Transport Authority (RTEC) and IM Urban Bus Park (PUA). As an exception, the connection with the city of Ialoveni, not administratively included in the Municipality of Chisinau, is provided by RTEC, with the separate financial contribution of the city.

The two enterprises were established in 1949 and 1955, respectively, operated separately until 1994, merged in the form of the Chisinau Urban Transport Authority between 1994-1997 and separated again starting with January 1, 1998.

In addition to the two public operators, a number of 11 private operators operate on the same territory using minibuses on 32 routes². With the adoption of the [Decision of the Chisinau CM on Quality Standards for Municipal Public Transport](#), the activity of these operators should cease on September 1, 2022, except in the unlikely situation of complete replacement of minibuses with buses with dimensions, age and norms of pollution allowed. However, the full implementation of this measure seems to be conditioned by the provision by the Municipality of the vehicles necessary to cover the transport demand on the released routes, as well as by the rehabilitation of some streets, for the safe circulation of buses.

Observation:

The consultant could not obtain an official view on the chances that the mentioned Quality Standards will be fully applied as of September 1, 2022, and that the PUA will take the routes of the private operators.

The existence of several public transport operators in the same territory, in an open competitive market, can have positive effects, provided that there is real competition, strict application of management delegation contracts and good operational and investment coordination. However, for operators who have the same owner, in this case the Chisinau City Hall, there can be no real competition.

The specificity of public transport, at least in continental Europe, lies in the weighting of strict economic and financial rules with the recognition of social conditionality for an essential public service, resulting in the amendment of total market liberalization. This approach allows operators to be granted, on substantiated and transparent terms, *tariff differences* designed to offset the negative effects of *operating taxes*. These taxes are as follows:

² Communication DGTCC Chisinau City Hall

- ✓ covering areas by routes with unsustainable operating costs individually through transport demand and revenues;
- ✓ ensuring a minimum transport capacity through timetables and frequency of travel in areas and periods of time with the same poor profitability characteristics;
- ✓ limiting transport tariffs to socially acceptable levels.

A functional model, validated by good practice in the field, is described in [*Regulation \(EC\) No 1370/2007 of the European Parliament and of the Council on public passenger transport services by rail and by road*](#). This Regulation is not binding on the Republic of Moldova, but we appreciate that it can be useful for understanding and applying correct relations between the local administration and a public transport operator, which ensure fair and sustainable financial conditions.

In our understanding, the separation of the two public operators in Chisinau does not fit into this model. The separation was officially motivated primarily by the different operating costs, but these cannot be a viable reason in the field of public transport, because, validated, the criterion could be used for separation based on areas of operation, for example, what would amplify the lack of operational coordination. Almost all cities and metropolitan areas have a single public operator, even in situations where they use very different modes (tram, trolleybus, bus, light rail, heavy subway, cable car, water transport), which naturally have costs equally different operation. These costs are consolidated and the differences are irrelevant from the perspective of a unitary public service for the community.

The institutional separation of public operators, coupled with a very low level of operational coordination, has clearly negative effects on the coherence, efficiency and quality of the passenger service provided. All these were exposed in a study ³conducted in 2018, which maintains its validity. Despite the common coordination, through the Directorate of Public Transport and Communications within the Chisinau City Hall, the natural tendency of two different organizations, with already different structures, budgets and, probably, institutional cultures, is not to look beyond the limits of territory and competences. which have been attributed to them. The discussions that the consultant had at the senior level of the administrations of the two operators fully confirmed this situation.

The following will describe the effects of institutional separation from an operational point of view and propose measures with measurable effects both in improving the financial parameters of operation and in increasing the quality of the public transport service. As the vast majority of these measures are conditioned or aided by the merger of operators, they will be as many arguments for achieving institutional change.

In our opinion, the main levers on the operational side for increasing the attractiveness of public transport, increasing its efficiency and reducing the pressure on the local

³ Institute for European Policies and Reforms, “ Public Policy: Merger of the Chisinau Electric Transport Authority and the Urban Bus Park ” - 2018. [Microsoft Word - Public Policy - Merger of RTEC and PUA.Final.docx \(ipre.md\)](#)

budget at long-term sustainable values, are the application of a new tariff offer and the optimization of the transport network. An extremely prudent personnel policy will be able to complement these actions, within the limits imposed by social conditions.

1.2. Tariff policy and offer

The tariff policy brings together the principles applied for the motivation and construction of the *tariff offer*, which represents the commercial interface between the operator and the passengers. Good practices in the field, promoted in particular by the International Union of Public Carriers (UITP) and the World Bank (WB), can be summarized as follows:

- The fare offer must provide the framework for the collection of the travel tax at a level which, together with its own revenue and, if necessary, a subsidy for the fare difference, should ensure the operational budget and a reasonable profit (less than 10%, but usually about 5%) for development;
- The fare offer must be built on the principles of social acceptance and positive discrimination of *loyal travelers* compared to *occasional travelers*;
- The subsidy for the tariff difference should be granted to operators, regardless of their institutional situation, only for the contribution to cover *the eligible operating costs*, under the rigors of a *public service delegation contract*.

Basically, the recommended base rate (the rate for a single trip purchased separately) is around ***0.1% of the average net salary in the community served***. From here, any advance sale of the transport service, in the form of fixed travel packages, travel accounts and season tickets, should be reflected in lower prices offered per trip. The commercial motivation of the operator results from the advantages of collecting in advance the tax for the transport service - practically an unconditional and interest-free credit, as well as from the decrease of the expenses with the commercial activity - salaries and consumables.

Good practice in the field warns against the installation of a *spiral of poverty* in the public transport service, given that local governments are often tempted, for electoral reasons, to keep unjustifiably low fares for long periods of time, even if the main components of production costs (fuels, energy, spare parts and wages) increase by tens of percent or more. Avoiding a fair increase in fares, usually accompanied by only partial fulfillment of obligations to supplement the operating budget to the agreed level, inevitably leads to a quantitative and qualitative decrease in the benefit, to the removal of middle-income passengers, followed by increased pressure to maintain low fares from captive and vulnerable travelers, dwindling resources and so on. The danger that

public transport in Chisinau will become a poor quality and unsustainable service for citizens with minimal resources was exposed in the study mentioned on page 8⁴.

A modern and efficient management must take into account the fact that public transport is a determining factor of sustainable development, but also the reality that the passenger is less and less a captive customer, with no other options and satisfied with any level of quality. In the environment of UITP (International Union of Public Transporters) it is said that: " *a civilized country is not one in which the poor buy their cars, but one in which the rich go by public transport* ". The tariff offer is part of the quality parameters on the basis of which the public transport is judged by its beneficiaries.

From the point of view of the urban tariff offer for individuals, the situation in Chisinau is the following:

Table no. 1 - Current tariff offer with full urban tariffs, individuals

| OPERATOR | SIMPLE URBAN / LOCAL SUBURBAN TICKET | SUBSCRIPTION SEMILUNAR | MONTHLY SUBSCRIPTION |
|----------|--------------------------------------|------------------------|----------------------|
| RTEC | 2 lei | 100 lei | 180 lei |
| PUA | 3 lei | - | 200 lei |

For suburban PUA routes, the fare varies between 3 lei (inside the localities) and 3.50-6.00 lei for trips that include suburban and urban segments. In the case of RTEC, the tariff is unique.

There are also monthly subscriptions with various price reductions for pupils, students, budget students, family doctors and their assistants, pensioners with a pension below a set threshold and people with disabilities. It also benefits from reduced annual subscriptions for retirees who voluntarily give up nominal compensation. For holders of low-fare subscriptions, the only paid tariff integration facility works: the subscriptions are sold only by RTEC, and the revenues obtained are divided between RTEC and PUA in the ratio 93.2%/6.8% for reduced monthly subscriptions and 85.6%/14.4% for reduced annual subscriptions.

Observation:

The consultant did not receive satisfactory explanations justifying these reports, their accuracy and the differences between them, given that the use of subscriptions is considered identical for the two operators for the different categories of passengers (50, 65, 100, etc.).

⁴ Institute for European Policies and Reforms, " Public Policy: Merger of the Chisinau Electric Transport Authority and the Urban Bus Park " - 2018. [Microsoft Word - Public Policy - Merger of RTEC and PUA.Final.docx \(ipre.md\)](#)

There are also free travel rights for 13 categories of people established by local and republican regulations: veterans, decorators, employees of law enforcement agencies, etc., in the number of approx. 19,600 people⁵.

From the received information it results that the State does not contribute to the amounts not collected as a result of the republican regulations, which is financially incorrect and inconsistent with the good practices in the field.

1.2.1. The characteristics of the current tariff offer

- a. The diversity of the offer is minimal, a situation partially justified by the lack of a high-performance charging system for the issuance, sale, use and control of transport tickets. However, the lack of subscriptions for a route, to give just one example, cannot be justified and contributes, along with fares, to the lack of interest in subscriptions. The only modern aspect is a pilot project that allows payment by bank card in some buses and trolleybuses, but this is limited to the single ticket and is mostly done, completely atypical in the field, through cashiers, with or without issuing proof of payment;
- b. The two operators charge 50% different fares for the same urban transport service (single ticket); also, the taxation of suburban trips is done on different principles: differentiated tariffs for PUA, single tariffs for RTEC. Different urban tariffs for similar services in the two modes of transport create artificial and unproductive competition, and the justification for the different operating costs is not valid;
- c. The basic rate is well below the value recommended by good practice in the field and has remained the same for the last 12.5 years - since September 2009, when the last update was made. According to these practices, the fare for the single ticket should currently be 5-6 lei. During this period, the sharp rise in wages and prices for fuel, energy and spare parts brought operating costs to unsustainable levels. No strict increase in the inflation rate has been applied, which would have led to almost a doubling of tariffs from 2009 to date⁶. The result is a chronic underfunding of the public transport service and a permanent increase in pressure on the local budget.
- d. The ratio between the price of the monthly subscription and that of the single ticket is 90 in the case of RTEC and 66 in the case of PUA. The values are irrational, 2-4 times higher than what is practiced in the field and is due to Decisions no. 8/8 of 15.09.2009 and no.1/2 of 29.01.2010 of CM Chisinau, which grants the two public operators the right to issue monthly subscriptions, at the tariff resulting from the cost price, without compensation from the budget. Moreover, in January 2016 an attempt was

⁵ Communication DGTCC Chisinau City Hall

⁶ Stanislav Ghiletski, press article

made to increase the RTEC subscription to 200 lei, the single ticket remaining unchanged. It is not clear what increase in revenues was relied on, since the sale of subscriptions is extremely limited and would have fallen even further following the tariff increase. By equating to the price of 66 or 90 tickets, the subscription is not tempting even for travelers who constantly and fraudulently use two routes for two compound trips per day, using 4 tickets. The incorrect ratio between the subscription price and the ticket price was also highlighted in the 2013 Consultation Report⁷.

From the above, there are 4 characteristics with a strong negative impact on the coherence and attractiveness of the current fare offer: it is extremely limited, is different for the two operators, has poor fare integration and disadvantages loyal travelers by the ratio between subscription price and ticket price .

Fare policy must benefit loyal travelers by offering substantial benefits when buying season tickets. Good practice in the field indicates a ratio of 25-35 between the price of a general monthly subscription with an unlimited number of trips and the price of a single ticket, with or without limitation of the duration of the trip. For comparison, we present a table with the basic tariffs and for the general monthly subscription in 11 European cities and Chisinau. Tariffs are expressed in local currency, but in this case only the final report mentioned above is of interest.

The examples can be extended beyond the cases presented and confirm a situation far out of the ordinary: the ratio between the basic tariff and the general monthly subscription has extremely high values in Chisinau, which make the subscriptions totally unattractive, strongly disadvantaging the category of passengers that needs the most tariff protection.

Table no. 2 - Comparison of subscription / ticket ratios

| THE CITY | TICKET | AB. MONTHLY | AB. LUNAR / BILET |
|-----------|--------------|-------------|-------------------|
| Bucharest | 3.00 | 80.00 | 27 |
| Iași | 2.50 | 80.00 | 32 |
| Brașov | 2.50 | 85.00 | 34 |
| Timișoara | 4.00 | 130.00 | 35 |
| Dresda | Zone 1: 1.70 | 51 | 30 |
| | Zone 2: 4.50 | 93 | 21 |
| Brno | 20 | 830 | 46 |
| Vienna | 2.40 | 51 | 20 |
| Linz | 2.60 | 52.10 | 20 |
| Lyon | 1.90 | 66.40 | 35 |

⁷ Chisinau Public Transport Project Consultancy program on public transport regulation and restructuring Chisinau Municipality Transport Strategy . <https://docplayer.org/68025975-Proiectul-de-transport-public-din-chisinau-strategia-de-transport-a-municipiului-chisinau.html>

| | | | |
|----------|-----------|--------|----|
| Bilbao | 0.66 | 30.00 | 45 |
| Lublin | 4.20 | 119.00 | 28 |
| Chişinău | RTEC 2.00 | 180.00 | 90 |
| | PUA 3.00 | 200.00 | 66 |

Some previous studies have identified, for the most part explicitly, some of these problems. For example⁸, at PUA, the percentage of subscription usage from the total paid trips was reported by 18% in 2019, while at RTEC this parameter was 12%. The consultant has reservations about the correctness of these figures, because the actual use of subscriptions cannot be counted. However, the percentage ratios between the amounts collected on tickets, respectively on all types of subscriptions, compared to the total receipts (without compensations), according to the latest available data, those for 2021. These are not normal figures in the field and only confirm the trade imbalance of the tariff offer.

Table no. 3 - Receipts from tickets / subscriptions

| | RTEC | PUA | TOTAL |
|----------------------------|--------------|--------------|-------------|
| TICKETS (lei) | 176,818,700 | 44,887,562 | 221,676,262 |
| SUBSCRIPTIONS (lei) | 18,166,700 | 1,124,590 | 19,291,290 |
| TOTAL | 194,985,400 | 46.012.152 | 240,967,552 |
| TICKETS (%) | 90.7% | 97.6% | 92% |
| SUBSCRIPTION (%) | 9.3% | 2.4% | 8% |

The social acceptability of public transport fares is extremely important, and opinion polls can give very useful indications in this regard. The study mentioned above also contains references to a survey that included questions about tariffs. The answers reveal the acceptance of a maximum tariff of 5-7 lei provided that the qualitative parameters of the public service are improved, which would correspond to the recommended values of approx. 0.1% of an average net salary of 5000-6000 lei. The result is somewhat surprising for an Eastern European country, with selective memories of a past with free or very cheap services, but generally of poor quality. The result is at the same time encouraging for the prospect of bringing public transport fares in line with economic realities.

⁸ Soros Foundation - Efficiency of public transport management in Chisinau . Public policy study . Cris ti na Voroneanu, 2020 [Studiu Cristina Voroneanu compressed.pdf \(soros.md\)](#) .

1.2.2. Motions

Changing the tariff policy of a future single operator and improving the fare offer for passengers can and must be effective tools both for increasing the attractiveness of public transport and for reducing the pressure on the local budget by increasing revenues. A complete change also involves the modernization of the charging system, which allows securing all commercial activities of contact with the passenger of the operator and diversification of the tariff offer, but this modernization requires relatively significant investments, at least 2 years for preparation of documentation, contracting and implementation of this study. In the following, proposals for immediate improvements will be made, with the current facilities and commercial procedures.

The basic idea is to increase the basic fare (urban ticket) and simultaneously reduce the subscription fee, both by a significant percentage compared to current levels - especially in the case of the ticket. The result must be an increase in the attractiveness of public transport, the advantage of loyal passengers and an increase in revenue.

A first step must be the modification of the Decisions of CM Chisinau no. 8/8 of 15.09.2009 and no.1/2 of 29.01.2010, by which the subscriptions are excluded from the subsidy through the local budget. Such a situation is unique in public transport and directly determines a very high price of the monthly subscription compared to the single ticket and, as a result, the total lack of attractiveness of the first. In support of this view, it should be emphasized that season tickets are primarily aimed at the majority of low- and middle-income passengers with compulsory daily travel, who are heavily dependent on public transport and who are therefore entitled to tariff facilities. If it is necessary for the local authority to grant a tariff difference (and in Chisinau it is also required), this community effort must be directed entirely or mostly towards subscriptions. It is a social protection measure recognized and applied as such in all European public transport networks.

The construction of a new tariff offer should also be based on knowledge of transport demand. A new survey is needed among travelers, which must determine, by statistical methods, the category (regular/occasional traveler), the average daily number of trips, the number of routes frequently used for a trip, the desired structure of the fare offer, but its achievement and the interpretation of the data obtained go beyond the scope of this study. In the absence of these data, the only possibility at present is to resort to the usual figures in the European public transport sector.

1.2.3. Calculation methodology

In the following, the calculation of the new unified tariffs proposed for the tariff offer will follow the following steps:

1. Calculation of the number of passengers - loyal and occasional public transport users and the degree of use of transport tickets, starting from the sales figures reported by the two operators and assuming reasonable principles, generally valid in public transport networks;

2. Analysis and verification of calculated results;
3. Proposing variants for the ticket (basic fare), keeping the current coefficients of multiplication of the basic fare for suburban routes with urban extension;
4. Calculation of the tariff for the monthly urban subscription, based on an estimated degree of use and with the objective of lowering the price compared to the current one;
5. Proposing new tariff products;
6. The estimated calculation of the receipts with the new tariff offer, starting from the number of users by categories of tariff titles, with the objective of obtaining an increase of at least 50% compared to the present.

1.2.4. Number of passengers - public transport users

The number of passengers, ticket buyers and season tickets, becomes an important parameter if we want to build a new fare offer and appreciate the financial effects produced by it. The importance stems from the need to know the approximate number of buyers for each tariff product, in order to assess the financial effect of the migration from one product to another. These figures are not usually used, which is why they do not appear in regular reports, focusing on the loading of means of transport and receipts. Estimating them is difficult and requires laborious calculations, based on reasonable assumptions about the degree of use.

In the common language of reporting, the notion of *passengers* is used to describe the use of public transport, but in reality it is about repetitive *journeys* made by individuals. The following will make a clear distinction between *passengers* (users) and *passengers* (repetitive presence of passengers in means of transport).

In Chisinau, the only sure figures are the number of nominal tickets and season tickets sold, implicitly the amounts collected, but there is no possibility to record the number of trips made with a season ticket. The two operators use the standard figure of 50 trips/month, confirmed by the calculations below. Even more difficult to understand is the decision to form the price of the subscription by multiplying the ticket 90 times at RTEC and 66 times at PUA.

In the absence of usage data, we must use the example of other public transport networks, with the reasonable assumption that transport habits for loyal and occasional travelers are not very different in Chisinau. These assumptions are as follows:

- Public transport users are generally 40-50% of the area's population. With a population of 640,000 inhabitants for Chisinau (2021)⁹ and given the decrease in the use of public transport in recent years, it is proposed to apply a percentage of 40%, which leads to the figure of 256,000. This is

⁹ <https://www.worldometers.info/world-population/moldova-population/>

not only about the increasing use of alternative means of transport (in Chisinau especially the increase in the number of cars), but also about the population that does not use public transport due to income, age (young children/elderly) or real physique disability;

- In an area with normal economic and social activity (not holiday destinations, for example), loyal travelers usually represent 70-80%, and occasional 30-20% of the total. For Chisinau, the ratio was considered more unfavorable than 70/30%, respectively 179,200 and 76,800;
- A loyal traveler buys an average of 11 monthly subscriptions, or 22 subscriptions of 15 days per year, or a combination that optimally covers its periods of activity;;
- A monthly subscription for a legal entity is used by an average of 2 people considered loyal travelers, for 11 months a year;
- Loyal travelers, less retired retirees, make an average of 2 trips per working day, of which 20% on two routes, which means 2.4 single trips per day, 53 trips per month and 583 in 11 months per year;
- Discounted retirees should also be considered, through travel habits, loyal travelers. Not being conditioned by working days and holidays, it is estimated that they make about 72 trips per month and 865 per year;
- Occasional travelers make an average of 2 trips per week, with 2.4 tickets if you consider the increase of 20% due to travel consisting of 2 routes and should use an average of 115 tickets per year for 48 weeks.

With the data provided by RTEC / PUA and the above assumptions, the results of the calculations for the number of passengers are as follows:

Table no. 4 - Determining the number of passengers at RTEC and PUA

| | NUMBER OF TRANSPORT TITLES | | NUMBER OF PAYED TRAVELERS | | REVENUE FROM TRAVELERS (thousand lei) | |
|---|----------------------------|------------|--|------------------------------------|---------------------------------------|------------------|
| | RTEC | PUA | RTEC | PUA | RTEC | PUA |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Subscribe. monthly economic agents, budgetary and social institutions | 15,613 | 50 | 2,840 <small>2 x / (1) / 11</small> | 9 <small>2 x / (2) / 11</small> | 2,039.4 | 15.1 |
| Monthly subscription rate 100% | 28,355 | 307 | 2,835 <small>(1) / 11</small> | 31 <small>(2) / 11</small> | 5,103.9 | 67.47 |
| 15 day subscriptions 100% rate | 500 | - | 2.3 <small>(1) / 22</small> | - | 50.0 | - |
| Reduced monthly subscription | 57,377 | 6,288 | 13,686 | 1,272 | 10,973.43 | 1,041.99 |
| | 44,100 | | 18,947 | | 12,015.42 | |
| Retired monthly subscriptions and pers. with disabilities | 123,293 | 8,995 | 10,274 | 760 | 7,260.3 | 1,174.4 |
| | 132,288 | | | | 8,434.7 | |
| Total passengers with subscriptions | | | 19,384 | 1,452 | | |
| | | | 20,836 | | | |
| Ticket | 84,409,350 | 13,372,114 | | | 176,818.7 | 44,887.6 |
| Total tickets | 97,781,464 | | | | 221,706.3 | |
| Occasional travelers | | | 76,800 | | | |
| Loyal passengers with tickets | | | 152,600 | | | |
| TOTAL PAYMENT TRAVELERS | | | 264,073 | | | |
| TOTAL COLLECTIONS FROM TRAVELERS | | | | | 202,245.73 | 47,187.56 |
| (thousand lei) | | | | | 249,433.29 | |

The yellow boxes contain data communicated by RTEC / PUA, and the green boxes, calculated data.

If to the figure of 264,073 resulting for paying trips is added a part of the 19,600 beneficiaries of gratuities, it results a total of faithful travelers close to the figure advanced at the beginning - 256,000 people, approx. 70% of the total number of

passengers, which indicates, once again, the correctness of the assumptions made and the calculations made.

1.2.5. Analysis and verification of results

The number of passengers using season tickets can be approximated quite accurately based on sales and a number of 11 season tickets purchased per year for active individuals, or 12 season tickets purchased per year for retirees and people with disabilities). The result is a total number of approx. 20,850 passengers, with the observation that, in the case of economic agents, 2 persons per subscription were considered.

If the more than 97 million tickets reported as sold were used exclusively by occasional travelers, who use approx. 115 tickets per year, it would result that they are in number of over 840,000, which would exceed the number of inhabitants of the municipality. It follows that many tickets are bought by loyal travelers, as a direct result of the very high price of season tickets and, very possibly, the lack of season tickets for a route or two. With the approximations assumed, the 76,800 occasional travelers buy 115 tickets/year and person, a total of 8,832,000 tickets/year, the remaining 89,000,000 being bought by a significant part of the faithful travelers. As they need 583 tickets per year, it turns out that approx. **152,600 loyal passengers, ie 85% of them, buy tickets instead of season tickets.** If we refer only to loyal travelers with full payment, the percentage is even higher. The migration of most of them to subscriptions is one of the objectives of a new tariff offer.

Given that there are no direct measurements (through the charging system), or indirect ones (through surveys), it is difficult to say precisely whether the two operators have exclusively a dedicated audience, or what part of the audience they share. To simplify the calculations in the current phase, we considered that RTEC and PUA have completely separate areas from the public. The risk of altering the calculations is low for the following reasons: there is a very large imbalance between the two operators, practically only the PUA serves the suburban area, and the tariff integration is not accessible to most passengers.

1.2.6. Proposals for the basic tariff

In the following, it is proposed that the basic tariff should no longer be calculated on the basis of the cost price, to which an unfounded reduction should be applied, but should be established on the basis of good practices in the field already set out and social acceptability. The cost price remains a very important element for the consolidated accounting calculations and for the justification of the claim for compensation by the authorities imposing tariff constraints.

The basic tariff (single urban / suburban ticket on the territory of the suburban locality) is initially proposed in the variants of 4 lei, 5 lei and 6 lei, as a basis for calculating the price of the main subscriptions and evaluating the resulting financial effects. Tariffs for

suburban tickets with urban extension are proposed according to the same rules as at present, by increasing the current ones with the ratio between the new and the old basic tariff.

1.2.7. Calculation of subscription fees

The tariffs for the subscriptions with full payment are calculated based on the presumed number of uses for each category, with the application of a reduction of 20, 30 and 40% and with the rounding of the result to 5 lei. Subscriptions with increases/reductions are proposed starting from the general monthly subscription, with the same calculation formulas as at present.

1.2.8. New tariff products

6 new subscriptions are proposed, which will increase the attractiveness of the new fare offer, increase the number of public transport users and increase revenues. The action is possible with the current technical endowment and will directly lead to an improvement in the quality of public transport through a better adaptation of the fare offer to the transport habits of passengers:

- **The monthly subscription for an urban route**, calculated for 44 trips/ month, with a discount of 20-30-40%, depending on the option chosen for the general subscription and with rounding to 5 lei;

- **15-day pass for an urban route**. Following the general rule of connection between the bonus and the validity period, it can be calculated at 60% of the monthly one, with rounding to 5 lei.

Observation

The introduction of subscriptions for a line will affect receipts, due to the migration from the general monthly subscription to an extent that we cannot quantify at this time. However, the lack of this product in the tariff offer can strongly affect the attractiveness of the season tickets, given that a significant part of the passengers are obliged to buy general season tickets, and they usually use a single route. Along with the discouraging price, this mismatch between transport habits and the current fare offer seems to be an additional reason for the current refusal of subscriptions.

Also, the reduction in the price of subscriptions will accordingly reduce the amounts transferred from PMC to compensate for reduced subscriptions, but the effect on receipts will be minimal.

- **Monthly subscription for a suburban route, with local use**. The fare should be the same as for the subscription for an urban route;

- **15-day subscription for a suburban route with local use**. The rate would be 60% of the monthly subscription;

- **Monthly subscription for an extended urban suburban route, plus an urban route**. The tariff is established as the sum of the 2 components;

- **15-day subscription for an extended urban suburban route, plus an urban route**. The tariff is established as the sum of the 2 components.

1.2.9. Calculation scenarios

3 scenarios are discussed, based on 3 variants of migration of loyal passengers from tickets to season tickets: 50%, 70% and 90%. Each scenario contains 9 variants, corresponding to the 3 basic tariffs proposed and the 3 discount tranches (20, 30 and 40%) applied to the gross price of the monthly subscription. This will result in 27 possible variants grouped into 3 scenarios.

These calculations and their results are presented in detail and transparently, in Excel format (in Annexes 1a-1c) and in summary in Tables 5, 6 and 7 below. Of course, the calculations can be repeated with any plausible combination of parameters, but those presented seem to close best.

The exposed variants were built on the basis of common premises:

1. Total reference receipts (2021): 250,000,000 lei;
2. Total passengers: 256,000, of which 70% (179,200) faithful and 30% (76,800) occasional;
3. Travel habits:
 - Loyal travelers, with season tickets: 2.4 trips/working day, 53 trips/month, 11 months/year;
 - Occasional travelers, with tickets: 2.4 tickets/week, 48 weeks/year, 115 tickets/year;
4. Basic fare (ticket): 4.00 lei, 5.00 lei and 6.00 lei;
5. Calculation discount on gross subscription: 20%, 30%, 40%.

Table 5 - Scenario 1: 50% of loyal ticket travelers migrate to season tickets

| ALTERNATIVE | PREMISES | | RESULTS | | | |
|-------------|----------|------------------------------|-------------------------|----------------------------|----------------|-----------------|
| | TICKET | SUBSCRIPTION DISCOUNT. CRUDE | SUBSCRIBE. MONTHLY 100% | SUBSCRIBE. MONTHLY/ TICKET | TOTAL REVENUES | INCREASE INCOME |
| 1 | 4 lei | 20% | 170 lei | 43 | 414,244,102 | 66% |
| 2 | 4 lei | 30% | 150 lei | 33 | 390,598,867 | 56% |
| 3 | 4 lei | 40% | 125 lei | 31 | 361,042,322 | 44% |
| 4 | 5 lei | 20% | 210 lei | 42 | 514,849,473 | 106% |
| 5 | 5 lei | 30% | 185 lei | 37 | 485,429,929 | 94% |
| 6 | 5 lei | 40% | 160 lei | 32 | 485,292,929 | 82% |
| 7 | 6 lei | 20% | 255 lei | 43 | 621,366,153 | 149% |
| 8 | 6 lei | 30% | 220 lei | 37 | 579,986,991 | 132% |
| 9 | 6 lei | 40% | 190 lei | 32 | 544,519,138 | 118% |

Table 6 - Scenario 2: 70% of loyal ticket travelers migrate to season tickets

| ALTERNATIVE | PREMISES | | RESULTS | | | |
|-------------|----------|------------------------------|-------------------------|----------------------------|----------------|-----------------|
| | TICKET | SUBSCRIPTION DISCOUNT. CRUDE | SUBSCRIBE. MONTHLY 100% | SUBSCRIBE. MONTHLY/ TICKET | TOTAL REVENUES | INCREASE INCOME |
| 1 | 4 lei | 20% | 170 lei | 43 | 400,143,862 | 60% |
| 2 | 4 lei | 30% | 150 lei | 38 | 369,784,227 | 48% |
| 3 | 4 lei | 40% | 125 lei | 31 | 339,424,591 | 36% |
| 4 | 5 lei | 20% | 210 lei | 42 | 496,384,873 | 99% |
| 5 | 5 lei | 30% | 185 lei | 37 | 458,435,329 | 83% |
| 6 | 5 lei | 40% | 160 lei | 32 | 420,485,784 | 68% |
| 7 | 6 lei | 20% | 255 lei | 43 | 600,215,793 | 140% |
| 8 | 6 lei | 30% | 220 lei | 37 | 547,086,431 | 119% |
| 9 | 6 lei | 40% | 190 lei | 32 | 501,546,978 | 101% |

Table 7 - Scenario 3: 90% of loyal ticket travelers migrate to season tickets

| ALTERNATIVE | PREMISES | | RESULTS | | | |
|-------------|----------|------------------------------|-------------------------|----------------------------|----------------|-----------------|
| | TICKET | SUBSCRIPTION DISCOUNT. CRUDE | SUBSCRIBE. MONTHLY 100% | SUBSCRIBE. MONTHLY/ TICKET | TOTAL REVENUES | INCREASE INCOME |
| 1 | 4 lei | 20% | 170 lei | 43 | 386,043,622 | 54% |
| 2 | 4 lei | 30% | 150 lei | 38 | 348,969,587 | 40% |
| 3 | 4 lei | 40% | 130 lei | 31 | 302,627,042 | 21% |
| 4 | 5 lei | 20% | 210 lei | 42 | 477,920,273 | 91% |
| 5 | 5 lei | 30% | 185 lei | 37 | 431,577,729 | 73% |
| 6 | 5 lei | 40% | 160 lei | 32 | 385,236,184 | 54% |
| 7 | 6 lei | 20% | 255 lei | 43 | 579,065,433 | 132% |
| 8 | 6 lei | 30% | 220 lei | 37 | 514,185,871 | 107% |
| 9 | 6 lei | 40% | 190 lei | 32 | 458,574,818 | 84% |

The values that do not meet the minimum conditions regarding the price of the subscription, the ratio between it and the basic tariff and the estimated revenue increase were marked in red.

Observation:

The reference receipts from 2021, of approx. 250,000,000 lei, as estimated in the calculation scenarios, refer only to the amounts collected from passengers, so they also include the amounts collected from season tickets for pensioners and people with disabilities, but not the amounts transferred by the Directorate of Social Protection of Chisinau City Hall for co-payment of subscriptions for pupils, students and vulnerable categories of retirees. However, the number of these subscriptions was taken into account when calculating the number of public transport users.

I.2.10. Analysis of scenarios and variants

The new tariff offer can bring an increase in receipts from passengers between 21% and 149%, depending on the basic fare chosen, the reduction applied to the gross price of the monthly subscription and the estimated migration of loyal passengers from tickets to subscriptions (see Annexes 1a, 1b and 1c, as well as synthetic tables 5, 6 and 7).

Remarks:

1. In the calculation tables (Annexes 1a-1b), the new amounts received from pensioners and people with disabilities were calculated the correction of the current ones with the ratio between the price of the new subscriptions and the current tariff of 180 lei.

2. The amounts collected will be slightly diminished by the decrease of the tariff for the reduced subscriptions and by the migration of some passengers from the general subscription to the subscriptions on 1-2 routes, cheaper. On the other hand, the more expensive tickets for the suburban localities were not taken into account. These two divergent issues will more or less offset each other, with minor effects on revenue forecasts.

The analysis of the simulations shows that the increase in revenues increases with the increase of the basic fare, but decreases with the increase of the proportion of loyal travelers who migrate from tickets to season tickets, due to the fact that the equivalent price of a trip is much lower for season tickets. From this it could be concluded that maintaining the current situation, in which most loyal passengers buy tickets and not season tickets, would be in the interest of the operator and the City Hall. In other words, there should be no incentives to migrate from tickets to season tickets, because this migration reduces revenue. In reality, good practice in the field indicates that the best possible balance must be struck between increasing revenues and an attractive and fair tariff offer.

The analysis of the scenarios and of the variants was done by scoring, with the verification of the fulfillment of the selection/exclusion criteria: the level of receipts, the subscription/basic tariff ratio and the price of the monthly subscription with full payment. Three parameters were taken into account:

1. Increase in revenues by at least 50% compared to the last reference level (2021);
2. Full monthly subscription/ticket ratio less than 40;
3. The final price for the full monthly subscription is lower than the current one at RTEC (180 lei).

The application of the criteria for choosing the optimal variant is illustrated in the following table:

Table no. 8 - Score of the new tariff offer variants

| SCENARIO | ALTERNATIVE | INCREASE REVENUES > 50 % | SUBSCRIPTION/ TICKET REPORT < 40 | SUBSCRIPTION PRICE . <180 LEI | FINAL SCORE |
|----------|-------------|--------------------------|----------------------------------|-------------------------------|-------------|
| 1 | 1 | X | | X | 2 X |
| | 2 | X | X | X | 3 X |
| | 3 | | X | X | 2 X |
| | 4 | X | | | 1 X |
| | 5 | X | X | | 2X |
| | 6 | X | X | X | 3 X |
| | 7 | X | | | 1 X |
| | 8 | X | X | | 2X |
| | 9 | X | X | | 2 X |
| 2 | 1 | X | | X | 2 X |
| | 2 | | X | X | 2 X |
| | 3 | | X | X | 2 X |
| | 4 | X | | | 1 X |
| | 5 | X | X | | 2 X |
| | 6 | X | X | X | 3 X |
| | 7 | X | | | 1 X |
| | 8 | X | X | | 2 X |
| | 9 | X | X | | 2 X |
| 3 | 1 | X | | X | 2X |
| | 2 | | X | X | 2 X |
| | 3 | | X | X | 2 X |
| | 4 | X | | | 1 X |
| | 5 | X | X | | 2 X |
| | 6 | X | X | X | 3 X |
| | 7 | X | | | 1 X |
| | 8 | X | X | | 2 X |
| | 9 | X | X | | 2 X |

The marked variants correspond to those that do not have any red number (representing the exit from the assumed parameters) from tables 5, 6 and 7.

1.2.11. Recommendations

The purpose of modifying the fare offer is to increase revenues, simultaneously with increasing the attractiveness of public transport through differentially applied fares,

depending on the requirements of passengers . Under these conditions, the analysis of the results of the simulations described above leads to the following conclusions and recommendations:

The variants that cumulatively meet these criteria are the following:

1. Option 2 of Scenario 1, with the 4 lei ticket, the 150 lei subscription after a 30% discount, the migration of 50% of the faithful trips to the subscriptions and an increase of 56% to the receipts;
2. Option 6 of Scenario 1, with the 5 lei ticket, the 160 lei subscription after a 40% discount, the migration of 50% of the faithful trips to the subscriptions and an increase of 82% to the receipts;
3. Option 6 of Scenario 2, with the 5 lei ticket, the 160 lei subscription after a 40% discount, the migration of 70% of the faithful trips to the subscriptions and an increase of 68% to the receipts;
4. Option 6 of Scenario 3, with the 5 lei ticket, the 160 lei subscription after a 40% discount, the migration of 90% of the faithful travelers with season tickets and an increase of 54% in receipts;

In fact, from the point of view of the proposed tariffs, the four variants are reduced to two (4/150 lei, respectively 5/160 lei), resulting from different assumptions regarding the percentage of migration of loyal passengers with tickets to season tickets.

Option 2 of Scenario 1 (ticket 4 lei, subscription 150 lei), apparently attractive, may be too risky, because any migration over 50% will lead to a decrease in revenue growth below the declared target.

The consultant recommends the basic tariff (urban ticket) 5 lei and the general urban monthly subscription (all routes) 160 lei (variant 6 from Scenario 2). This variant is based on an average value (70%) of migration of loyal passengers from tickets to season tickets, with an estimated increase in revenues of 65-70%. If the migration rate is lower, around 50%, the revenue increase will increase to approx. 82%, but it will also be a signal that subscriptions are not attractive enough. On the other hand, a migration percentage of 90% is less likely to decrease the revenue increase to the limit declared acceptable, of 50%. In these circumstances, the new single operator tariff offer in the recommended version could be the following:

Table no. 9 - New urban tariff offer (full tariffs)

| Urban ticket | General urban monthly subscription (53 gross travel, red. 40%, rounding) | 15 days general urban subscription (60% of the monthly, rounding) | Monthly subscription 1 urban route (40% of the monthly, rounding) | 15-day subscription 1 urban route (60% of the monthly, rounding) |
|--------------|---|--|--|---|
| 5.00 lei | 160 lei | 95 lei | 65 lei | 40 lei |

For the subscriptions with discount, a correction coefficient was applied to the current tariffs, equal to the ratio between the new general subscription and the old general subscription (160 lei/180 lei = 0.89) and rounding to 5 lei.

Table no. 10 - New tariff offer (reduced rates, monthly subscriptions)

| Economic agents (correction coefficient 0,89) | Budgetary institutions (correction coefficient 0, 89) | Social institutions (correction coefficient 0, 89) | Pupils and students (correction coefficient 0,89) | Budget students (correction coefficient 0, 89) | Retirees (correction coefficient 0, 89) | Persons with disabilities (correction coefficient 0, 89) |
|--|--|---|--|---|--|---|
| 285 lei | 220 lei | 60 lei | 60 lei | 50 lei | 60 lei | 55 lei |

For the suburban tickets with mixed route, an increase corresponding to the new basic tariff was applied compared to the current one at PUA (5 lei/3 lei). For the new monthly subscription a mixed urban + suburban route were considered only 44 trips/ month (people in the suburban area being less mobile after working hours) and a 40% discount. The same subscription for 15 days was calculated as 60% of the monthly one, and for the addition of an additional urban route the components were added together.

Table no. 11 - New suburban + urban tariff offer

| Suburban ticket with local route | Suburban ticket + urban route (increase by 67%, rounding) | Monthly subscription 1 suburban route + urban route (44 gross travel, 40% reduction rounding) | 15-day pass 1 suburban route + urban route (60% of the monthly, rounding) | Monthly subscription 1 suburban route + urban route + 1 urban route (sum of components) | 15-day pass 1 suburban route + urban route + 1 urban route (sum of components) |
|----------------------------------|--|--|--|--|---|
| 5.00 lei | 7.00 lei | 105 lei | 65 lei | 170 lei | 105 lei |
| | 6.50 lei | 115 lei | 70 lei | 180 lei | 110 lei |
| | 7.50 lei | 130 lei | 80 lei | 195 lei | 120 lei |
| | 8.50 lei | 150 lei | 90 lei | 215 lei | 130 lei |
| | 9.00 lei | 160 lei | 95 lei | 225 lei | 135 lei |
| | 10.00 lei | 175 lei | 105 lei | 240 lei | 150 lei |

It is also proposed to waive the single fare for trolleybus routes and to adopt the differentiated fare currently charged by the PUA. Thus, the urban+suburban trolleybus

routes will be equivalent to the routes in table 11, corresponding to the length of each such route. In this way, travel taxation will become unitary in Chisinau and will keep the current principle more correctly applied to PUA - tariffs differentiated according to the length of the route (a kind of simplified area tariff), while maintaining local tariffs at urban level.

Observation:

The transport regulation must provide for the permission that on the common sections of several routes and strictly only on these, a season ticket issued during the period of validity issued for any of the routes of that section may be used. It is a normal and widespread facility in the field, as an additional advantage granted to subscribers.

The consultant is aware of the major social impact of this operation, as well as its political conditions and risks. Therefore, it declares its readiness to deepen these calculations together with the final beneficiary of the study, in order to incorporate a better knowledge of the city and to identify the best solution.

The consultant also appreciates that a well-thought-out public campaign to promote a new fare offer will be able to highlight the significant reduction in subscriptions, the emergence of new fare products and the additional common section facility as opposed to ticket prices, to the advantage of the most many more justified travelers .

The tariff offer proposed in this study ensures both a much fairer trade relationship with travel and a substantial increase in revenues, an increase estimated at at least 50%, possibly 70%, with the consequence of a corresponding decrease in pressure on the local budget and the release of financial resources. important for investments in infrastructure, vehicles and support systems. It should be emphasized that the increase in revenue was not taken into account as a very likely increase in the number of passengers due to a much improved fare offer as a number of components and as a balance between them. An overly optimistic expectation is not reasonable, beyond a few percent, but even so, you can earn a few million lei a year. And increasing revenues is just one of the advantages for the city of moving travel preferences to public transport.

The estimate of positive financial results is, of course, approximate and cannot be otherwise. However, the consultant has the assurance of correct calculations and a significant improvement in the financial situation of the operator.

An already mentioned study¹⁰ showed that the proposed increase in the basic tariff is socially acceptable, all the more so as it is accompanied by a substantial reduction in the price for subscriptions and the introduction of new tariff products, in line with good practice in the field.

The Consultant considers that the proposed rebalancing of tariffs and their diversification must be applied as soon as possible. Conditioning this action for an overall improvement in public transport travel conditions is not a viable solution, as such an improvement can only be the result of medium and long-term investments,

¹⁰ Soros Foundation - Efficiency of public transport management in Chisinau. Public policy study. Cristina Voroneanu, 2020 [Stiuu Cristina Voroneanu compressed.pdf \(soros.md\)](#) .

during which time the financial deficit of the public transport service would continue to increase to absolutely unsustainable values. On the contrary, the adoption as soon as possible could bring closer, through the released financial resources, the realization of the necessary investments.

1.3. The prospect of an automatic charging system

The above are immediately possible courses of action, with the current technical equipment. Diversifying the tariff offer with several new products - 30-day subscriptions that do not overlap on calendar months, travel accounts, integrated transport tickets in case of maintaining the institutional separation of operators, direct use of bank cards, etc., will make it mandatory another level of technical equipment. The perspective of developing an automatic charging system is not the subject of this study, but the pilot project underway at the two operators¹¹ for paying tickets on several bus and trolleybus lines with contactless VISA and MASTERCARD bank cards from two commercial banks was analyzed.



Photo 1



Photo 2

Payment with mobile POS



Photo 3 - Payment with boarded validator; Photo 4 - Boarded validator with display¹²



¹¹ <https://ionceban.md/un-nou-proiect-pilot-de-achitare-electronica-in-transportul-public-lansat-de-primaria-chisinau-si-visa-ion-ceban-despre-planurile-pentru-next-period/>

¹² <https://tv8.md/2021/03/16/foto-proiectul-pilot-de-tichetare-electronica-lansat-plata-se-va-face-in-continuare-la-taxatori-care-vor-fi-equipped-with-terminals>

The consultant followed some of the comments in the local media about this project. For example¹³, some travelers have reservations about paying by bank card, for security reasons. Others accuse the exceptional nature of vehicles with this facility and the fact that the possibility of electronic payment is only after boarding. Other opinions refer to the fact that pupils, pensioners and students are excluded from the start because they do not have cards, or to the fact that similar systems abroad are supplemented by transport cards, issued by operators, which allow the extension of payment from single tickets to subscriptions and travel accounts¹⁴.

The opinion of the consultant on this pilot project and on the comments above is as follows:

- ✓ The idea of the project is very good, but not for testing the technical possibilities (they exist as a mature technology, widely used in public transport), but for testing the reaction of passengers and getting them used to electronic means of payment;
- ✓ Being a pilot project, it is natural that only a part of the vehicles benefit from this facility. An additional and visible marking of these vehicles would probably have been useful;
- ✓ Payment can also be made with a mobile phone with NFC technology, on which a contactless bank card has been emulated;
- ✓ A more intensive promotion campaign should explain to travelers the lack of payment insecurities, provided that no PIN is required;
- ✓ The observation that pupils, students and pensioners do not have access to the payment of the card trip is unjustified, given that these categories of travelers do not have to buy tickets, being beneficiaries of discounted season tickets;
- ✓ The observation that it would be good for operators to issue their own transport cards, on which subscriptions, travel accounts, etc. can also be uploaded, is justified, but the facility is not included in this pilot project, as it would have required a higher level of investment in dedicated equipment and software applications.

At the same time, it must be said that the lack of sufficient coordination of suppliers, who were not required to have identical commercial procedures at the travel interface, hesitations in assessing the legality of payments not accompanied by the issuance of a tax receipt, and institutional separation of operators in a situation where passengers encounter in the vehicles included in the pilot project two types of payment procedures (with and without voucher), as well as three types of POS (validators) on board - some carried by cashiers, some identical to those portable, mounted in a protective box and with the printer turned off, others in their own housing, without a printer, but with a

¹³ https://adevarul.ro/moldova/actualitate/doar-188-numarul-total-calatorilor-platesc-electronic-troleibuzele-chisinau-1_6173c6c25163ec4271b3071e/index.html

¹⁴ <https://primariamea.md/chiar-vom-avea-tichetare-electronica-in-2021/>

display. The fact that some cashiers use POS, while others use mobile phones with a dedicated application is not an impediment for travelers.

These differences are not in favor of travelers, their assimilation and acceptance of electronic payment. Therefore, the situation may affect the conclusions that will be drawn at the end of the project, with the risk of being presented in a negative register, which will insist on non-acceptance and a very low degree of use.

The consultant estimates that a future specification for the automatic charging system will have to include the use of the contactless bank card (and the phone with NFC technology - *Near Field Communication*, on which a card is emulated), but not exclusively. With this card only tickets can be paid, and, ultimately, ticket buyers must be a minority. The bank card cannot process subscriptions, travel accounts and combinations of these categories. Therefore, it is absolutely necessary to have contactless transport cards issued by the operator for the vast majority of passengers, the faithful, with daily commutes imposed by economic activity or other aspects of life. Bank and transport cards must be processed at identical on-board validators, with identical procedures for passengers. Unlike what happens in the pilot project, it is essential that the operator or the City Hall imposes the technical specifications on the supplier and not vice versa, in a unitary approach on the entire public transport network.

Bank card payments are relative to the beginning of a mass use in the Republic of Moldova, but the advance is very fast. With over 2 million cards in circulation at the end of 2021, with an annual increase of 7% and 94% of contactless card transactions, the prospects are very promising¹⁵. This situation is an encouraging factor and provides favorable conditions for the modernization of the public transport charging system.

On the other hand, the approx. 900 tax collectors represent an anachronistic aspect, absolutely unique in the European public transport environment. With or without automatic charging systems, transport tickets purchased from their own commercial network, from third-party merchants or online must be marked or validated on boarded devices (even mechanical or electro-mechanical) or, in the worst case, shown drivers or controllers (only paid, discounted or free subscriptions).

Observation:

It is important that the passengers receiving free admission also have and present to the validators, within an automatic charging system, a specific transport ticket, for the metering of the transport load it generates and for which the operator must receive compensation.

Organizing business procedures without this category of employees will free up significant financial resources, which will outweigh possible fraud on the part of some travelers. A future feasibility study, necessary to substantiate the investment for an automatic charging system, will be able to provide an accurate cost/benefit picture.

¹⁵ <https://www.infotag.md/interview-ro/296168/>

1.4. Organization of the public transport network

1.4.1. Network topology

Public operators have as a common area the city of Chisinau, but have different characteristics in terms of suburban transport: RTEC has 23 urban routes (in the city of Chisinau) and 7 urban/suburban routes for 7 localities, while PUA has 5 urban routes¹⁶ and 19 urban/suburban routes for 26 localities¹⁷. The situation of the coverage of the suburban localities by all the public transport operators is the following:

Table no. 12 - Coverage of suburban localities (May 2022)

| TOWN | RTEC ROUTES | PUA ROUTE | ROUTE OP. Individuals |
|---|-------------|------------|-------------------------|
| Codru | | 9 | 108, 169, 173, 178, 193 |
| Cricova | | 2 | 152 |
| Durlesti | 1 | 11 | 101, 124, 125, 129, 180 |
| Ialoveni | 36 | | |
| Sângera | 31 | 18, 33, 44 | 118, 157 |
| Vadul lui Vodă | | 31 | 130, 131 |
| Vatra | | 16 | 136, 171 |
| Bacioi | | 4, 49 | |
| Bâc (Bubuieci) | | 39 | |
| Brăila (Băcioi) | | 4, 49 | |
| Budești | | 31 | 159 |
| Bubuieci, Humulești | 37 | 39 | 121, 137 |
| Durlesti | 35 | | |
| Cheltuitori (Tohatin) | | 34 | 151 |
| Goian (Ciorescu), Goianul Nou (Stăuceni) | | 47, 48 | 148 |
| Colonița | | 24 | 117 |

¹⁶ Including route A to the airport

¹⁷ <https://www.chisinau.md/tabview.php?l=ro&idc=534&id=2614&t=/Utile/Transport/Reteaua-transportului-public/Reteaua-transportului-public-pe-Rute/Rute-de-troleibuz>

| Condița | | | |
|---------------------------|-------------|-----------|-----------------------|
| TOWN | RTEC ROUTES | PUA ROUTE | ROUTE OP. Individuals |
| Cruzesti | | 38 | |
| Dobrogea (Sângera) | | 33 | |
| Dumbrava (Trușeni) | | | 126 |
| Făurești (Ciorescu) | | 48 | |
| Frumușica (Băcioi) | | 49 | |
| Ghidighici | | 46 | 106 |
| Grătiești | | 10, 28 | |
| Hulboaca (Grătiești) | | 28 | |
| Revaca (Sângera) | | 18, 44 | |
| Stăuceni | 32 | 37 | 140, 190 |
| Străistreni (Băcioi) | | 4, 49 | |
| Tohatin, Buneț, Satul Nou | | 31, 38 | 151 |
| Trușeni | 34 | | 135 |

Observation:

The communication of the specialized directorate of PMB shows that the situation of private operators is fluid, undergoing changes from one month to another.

Overlapping the list of suburban localities with the routes of the two public operators, the following stand out:

1. In 5 localities (Durlești, Sângera, Bubuieci, Humulești and Stăuceni) both public operators arrive;
2. In Sângera there are 3 bus routes and one trolleybus route, on different routes;
3. In 9 localities (Băcioi, Brăila, Goian, Goianul Nou, Grătiești, Revaca, Străistreni, Buneț and Satul Nou) there are 2 bus routes. Tohatin was not included in this enumeration, because it is served by 2 routes that form different directions - Cruzești and Vadul lui Vodă;
4. No public operator arrives in Condița and Dumbrava;
5. The city of Ialoveni, which is not administratively included in Chisinau, is served by RTEC, through route 36.

On the other hand, regarding the bus routes that have urban plus suburban route, the following are noted:

6. With very few exceptions, the bus routes reach the city center, 4 of them on the central boulevard, overlapping with 8 trolleybus routes, plus one that intersects it in 2 points, all contributing to the high values of traffic in the city center and being victims of this trafficking.

Observation:

A relatively minor fact is a good indicator of the lack of operational coordination between RTEC and PUA: the routes with numbers 5, 10, 23, 26, 31 and 36 are found at both operators, on different routes.

In the absence of an Origin/Destination study, the above analysis raises questions about the rationality of the overlap of the two modes of transport in 3 small localities, of the 4 routes (3 bus and one trolleybus), to which are added 2 routes of minibuses that serve Sângera, a small town of 20,000 inhabitants or of the 2 bus routes that serve other 6 localities. The situation in Ukraine, which suddenly worsened on the very first day of the consultant's mission to Chisinau, did not allow the scheduled assessment of the loading of some of the above-mentioned suburban routes, as well as other personal observations on the public transport network in Chisinau.

These findings, together with much weaker performance parameters for buses, lead to the idea that a partial reconfiguration of the public transport network is needed to increase the efficiency of the service, without affecting its quality by covering the areas served, but with the transport capacity offered. depending on the actual demand.

1.4.2. Principles of reconfiguring the public transport network

Partial reconfiguration of routes is necessary and possible, with the objectives of better integration, optimization of routes and reduction of urban congestion. The merger of the two public operators would obviously make this operation easier.

The consultant has identified the following principles that may underlie this reconfiguration:

1. The trolleybus network being very developed, having better operating parameters and being based, for the most part, on overhead contact wire, it is logical that an integrated vision favors its maintenance in its current form, with majority operation in urban areas.
2. The bus network, with much lower operating parameters and obviously more mobile and configurable, proposes the following:
 - a. Maintaining the current connecting routes between the city and the suburban area, with some corrections to eliminate parallels;
 - b. Avoiding crossing or entering the city center, by organizing routes/returns to nodal points on an inner perimeter (similar to the Ismail street area), ensuring trolleybus routes to continue the journey in the city center and beyond the center. Fragmentation of some routes may become

inconvenient for those who want to make direct routes from the suburbs to the center and beyond the center, but this kind of optimization is imposed by the practical impossibility of operating exclusively radial and diametrical routes, with inevitable concentration in the central area. On the other hand, the inconvenience of a route change can be greatly reduced by improving traffic frequencies and dedicated season tickets, which will replace the current obligation to buy only general season tickets. To these must be added the facilities of common stations.

The current specialization of the two modes and the proposal to keep it should not be interpreted as an argument for maintaining the institutional division of operators. The specialization within a single operator will ensure the maintenance of the current favorable situation - the connection by public transport of all localities around the capital, but with operational optimization and better coordination of operating and investment policies.

1.4.3. Proposals for reconfiguration of the public transport network

A. Elimination of duplication of suburban routes

A.1. Giving up one of the 3 bus routes to Sângera (18, 33 or 44), depending on the transport demand and the degree of occupancy;

A.2. Giving up route 48 for Ciorescu and maintaining route 47;

A.3. Giving up route 49 for Băcioi and maintaining route 4;

B. Limiting/shortening the urban route for some bus routes with urban+suburban route

B.1. Limitation of routes 2 and 10 in a transfer point with trolleybus routes in the area of the Tudor Vladimirescu roundabout - Bv. Grigore Vieru (Annex 2);

B.2. Limitation of route 9 in a transfer point with trolleybus routes in the area of the roundabout from the Ministry of Health (Annex 2);

B.3. Limitation of route 11 in a transfer point with trolleybus routes in the area of the roundabout from the Ministry of Health (Annex 3);

B.4. Shortening route 16 , by giving up the loop Șoseaua Petricani - Str. Mihai Viteazul - Calea Ieșilor (Annex 3).

Remarks:

1. Term "limitation" was used for the situation in which it is proposed to organize a new route on the initial route and "shortening" for the situation in which it is proposed to give up a part of the route, keeping the current ends of the line.

2. In most cases, there is no need to organize roadblocks in the city, with problems related to the availability of land - those in the suburbs are enough.

C. The takeover by the PUA of the public transport service in the villages of Condrîța and Dumbrava, as well as on the routes issued by the private operators who give up their service, or who do not meet the adopted quality standards.

The tables below illustrate the effects in Km/year of the abolition/limitation / reduction of some suburban bus routes in the Municipality and the city of Chisinau:

Table no. 13 - The effect of the abolition of some suburban routes

| ROUTE | DESTINATION | Km/ RACE | REDUCED Km | RACE/ DAY | REDUCED Km/DAY | REDUCED Km/ YEAR |
|-------|-------------|-------------|---------------|--------------|-------------------|------------------------|
| 4 | Băcioi | 30 | 30 | 36 | 1000 | 350,000 |
| 18 | Sângera | 20 (*) | 20 (*) | 28 | 550 (*) | 200,000 (*) |
| 48 | Ciorescu | 20 (*) | 20 (*) | 6 | 120 (*) | 43,000 (*) |

(*) In the absence of data communicated by the PUA regarding the length of the routes, the figures are roughly estimated

Table no. 14 - The effect of limiting / shortening some suburban routes in Chisinau

| ROUTE | DESTINATION | Km/ RACE | REDUCED Km | RACE / DAY | REDUCED Km / DAY | REDUCED Km / YEAR |
|-------|-------------|-------------|---------------|---------------|---------------------|-------------------------|
| 2 | Cricova | 32 | 5 | 52 | 260 | 95,000 |
| 9 | Codru | 28 | 6 | 32 | 190 | 69,000 |
| 10 | Grătiești | 2.3 | 5 | 17 | 85 | 31,000 |
| 11 | Durlești | 37 | 8.5 | 18 | 150 | 54,000 |
| 16 | Vatra | 36 | 9 | 24 | 215 | 78,000 |

The application of optimization measures on the 5 suburban lines would reduce the annual course by approx. 327,000 Km. If we add the effect of the 3 canceled routes (approx. 593,000 km), the result reaches approx. 920,000 Km. Compared to the annual distance of 8,083,000 km¹⁸, this figure represents approx. 11.4%, which would be a significant reduction. Subject to the preservation of quality parameters to meet transport demand and the identification of appropriate spaces for the new terminus points in the city, these proposals can generate significant savings for bus operation, while freeing the city center from the vehicles of 8 bus routes.

If the current transport capacity on the routes subject to optimization is sufficient, the current traffic frequency can be maintained and the park made available can be used to take over routes from private operators who will no longer meet the conditions of the new quality standards. On the contrary, if the current transport capacity is insufficient, the park made available can be used to improve the frequency of traffic on limited/reduced routes.

¹⁸ PUA 2021 report

Public transport contributes to a small extent to the street congestion, but it is certainly a victim of this congestion, with the result of not realizing the transport plan in certain time intervals due to the reduced commercial speed below the planned one. Or, as the case may be, a realistic schedule, with longer succession intervals, but below the level of transport demand. Therefore, limiting some suburban routes by avoiding the center of Chisinau will not be felt both in reducing congestion, but in increasing the speed of trade on all these routes, improving regularity and predictability and, finally, increasing the quality of public service.

We emphasize that these proposals do not exhaust the possibilities of optimization, which may be the subject of further detailed analysis, having available all route operating data, a better knowledge of the local public transport market, as well as the direct experience of the AAP.

1.5. Traffic organization and management

The organization and management of traffic is currently done separately at the level of the two public operators, based on appointments in garages, confirmation of races on roadmaps, manual processing of these documents and an early tracking system of vehicles on the route - functional only the PUA.

The two operators define checkpoints as *dispatchers*, but it is clear that the term used far exceeds the actual functions and capabilities of the current system.

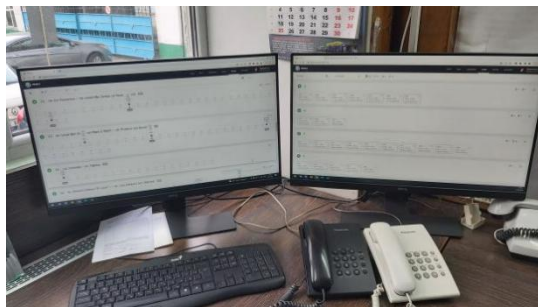


Photo 5 - PUA dispatcher

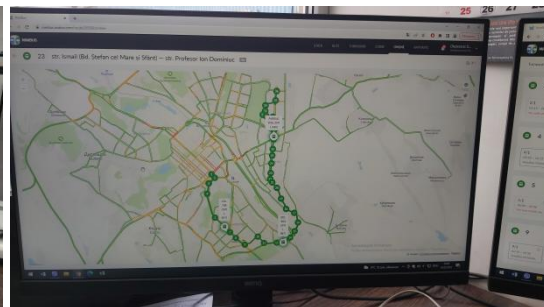


Photo 6 - PUA dispatcher

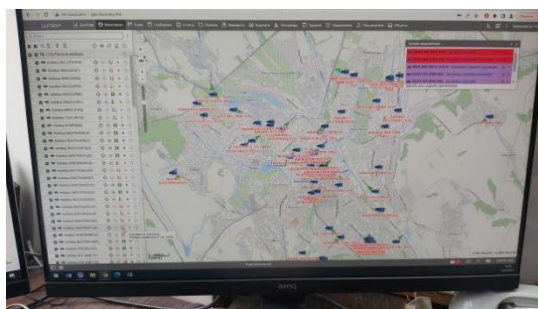


Photo 7 - PUA dispatcher

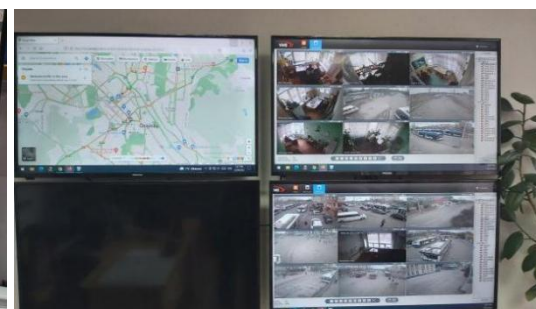


Photo 8 - RTEC dispatcher¹⁹

The functionality of these dispatchers is severely limited both by the fact that only some vehicles have functional onboard equipment (70 at PUA and none at RTEC after

¹⁹ Photos from the consultant's archive

termination of the contract with the supplier), and by the lack of specific applications for scheduling traffic, tracking adherence to the scheduled schedule. and report generation. There is also a lack of voice communication with drivers. The result is that the PUA is based on vehicle position identification (*tracking*), vector maps and public information on the degree of congestion of road arteries, while at RTEC can only track the degree of congestion of road arteries, which is anyway accessible with open applications like Waze.

Consultant appreciates that these systems are a good start, which must be continued and completed up to the level of a *Public Transport Management system*. It is necessary to develop technical specifications to achieve full functionality and a specification covering either a direct procurement procedure from the company that initiated the project or an open competition if the company can not continue the project in terms of technically or puts unacceptable conditions. However, the existing on-board equipment must be preserved, and its completion must be done at the current level. As with other support systems, it is essential that the technical specifications and the implementation of the projects are done in an integrated regime for the two modes of transport.

The coherence of the public transport operation requires, with or without the merger of operators, that these dispatchers be reunited and have the same facilities and functionalities. Moreover, good practices in the field demonstrate the usefulness of the functional (non-institutional) unification of the public transport management system (*Public Transport Management System*), with a future urban traffic management system (*Urban Traffic Management System*).

1.6. Improving public communication

During the initial documentation activity, the consultant accessed the web pages of the Chisinau City Hall, RTEC and PUA, finding the following:

- ✓ [PMC page](#) does not mention trolleybus routes 31, 32, 34 and 35;
- ✓ The list of routes with minibuses granted to private operators appears on the PMC page, but without information regarding traffic schedules and tariffs;
- ✓ On the PMC page, the city of Ialoveni does not appear as a locality served by RTEC. The city is not part of Chisinau, but the RTEC operator is owned by the Municipality;
- ✓ is no information on route 23 on the [PUA](#) page, which cannot be accessed in the displayed list of routes;
- ✓ On the PUA page, the fare offer appears inappropriate in the “INFO” sub-menu, but the ticket price is mentioned only in the context of bank card payment, and the “SUBSCRIPTIONS” sub-menu cannot be activated - so there is no information regarding full price subscriptions , discounts and gratuities;
- ✓ On the [RTEC page](#) , the trolleybus route scheme appears inappropriate in the “SCHEDULE” submenu ;

- ✓ The contactless bank card payment pilot project is not mentioned on the PMC and RTEC pages and is only incomplete on the PUA page - a news item about the extension of the fare reduction facility, without explaining the differences in procedures for travelers already mentioned.

From the above observations it follows that a person in first contact with public transport in Chisinau, or one who wants to obtain information about an operator other than the one frequently used, or data about the electronic payment system, will have difficulty in receive complete and non-contradictory information. This conclusion is reinforced by the personal experience of the consultant, during the documentation process for conducting this study.

Public transport is a service of major interest, which may lose its benefits and attractiveness if it is not treated uniformly, including in the communication between the provider and the beneficiaries. The good information of the passengers is part, together with the served area, integration, schedules, frequencies, tariff offer, safety and cleanliness, of the quality parameters with which this service is judged by the beneficiaries. Given that the vast majority of the population has access to the Internet, and other ways of classical information (information points, leaflets, etc.) are missing, it is imperative that the web pages of the 2 operators have a similar structure, consistent and with complete information, and the page of the Chisinau City Hall to gather relevant and complete information from all operators operating in the territory.

CHAPTER II

FINANCIAL ASPECTS

II.1. The main indicators of the activity, the situation of the patrimony and of the sources of coverage

II.1.1. Urban Bus Park

The analysis of the financial indicators of the activity of the enterprises for the period 2019-2021 based on the financial statements presented for the evaluation of their solvency are presented below.

The companies presented the main activity indicators for 2021 and the preliminary financial reports for 2021, but also the financial reports for 2019 and 2010. Below is the report of the main economic indicators, presented by the PUA to the consultant and the planned indicators, approved by CMC in the meeting from 29.02.2020 for the year 2021.

Report: Expenditures and revenues for 2021 for servicing bus routes managed by PUA

| Nr. do | Name of articles | United measure | FAPT indicators reported by PUA | | PLAN approved by CMC |
|--------|---|------------------|---------------------------------|-------|----------------------|
| 1 | Bus departure on working days | unity | 102.6 | | 104.0 |
| 2 | Total bus journey | thousand km | 8,082.7 | | 8,300.9 |
| 3 | Total income, including: | thousand lei | 195,318.7 | | 191,090.0 |
| | -come according to the contract with CSP | thousand lei | 148,022.0 | | 148,000.0 |
| 3 | -come from passenger transport | thousand lei | 47,296.7 | | 43,090.0 |
| | Expenses - in total | thousand lei | 226,165.0 | | 206,807.4 |
| | Inclusive: | | The amount | % | The amount |
| | Combustible | thousand lei | 46,859.1 | 20.7% | n / p |
| | Lubricants | thousand lei | 1,383.0 | 0.6% | n / p |
| | Electricity, heat, water | thousand lei | 2,376.4 | 1.1% | n / p |
| | Spare parts and materials | thousand lei | 12,407.9 | 5.5% | n / p |
| | Remuneration for work | thousand lei | 86,779.1 | 38.4% | 86,400.0 |
| | Social fund (24%) | thousand lei | 20,645.0 | 9.1% | n / p |
| | Wear of fixed assets | thousand lei | 17,170.1 | 7.6% | n / p |
| | Other expenses | thousand lei | 21,904.4 | 9.7% | n / p |
| | Validincom expenses | thousand lei | 16,640.0 | 7.4% | n / p |
| 5 | Expenses taken into account v-km cost (with Validincom) | thousand lei | 216,538.3 | | 191,090.0 |
| | Total transport volume, including: | thousand travels | 17,404.4 | | n / p |
| | a) with payment: | thousand travels | 15,808.0 | | n / p |
| | - tickets | thousand travels | 13,732.1 | | n / p |
| | - subscription | thousand travels | 2,075.9 | | n / p |

| | b) with facilities: | thousand travels | 1,596.4 | n / p |
|----|---|------------------|---------|-------|
| 8 | The cost of transporting a passenger | lei | 12.99 | n / p |
| 9 | The cost of a vehicle-kilometer | lei | 26.79 | 23.02 |
| 10 | Average travel fare | lei | 2.99 | n / p |
| 11 | Coverage of costs with the tariff collected | % | 2. 3% | n / p |

We notice a negative performance of most indicators compared to the values approved by the CMC: fewer buses on routes compared to the plan (by 1.4 on average), lower total turnover (by 218 thousand km), higher expenses by 19.4 million lei (9.4%) and, as a result, the cost of a vehicle-km higher by 3.77 lei, or 16.4% compared to the approved ceiling. Instead, revenues from ticket and season ticket sales were higher by 4.2 million lei, or 9.8%.

In 2021, PUA covered only 23% of its costs with sales receipts, the rest being covered by City Hall allocations (slightly above the approved amount of 148 million lei). It is an insufficient indicator and is due to extremely outdated tariffs. Revenues from sales do not cover even half of the expenses for employees. Obviously, the company cannot make investments from its own resources and relies only on the means allocated from the City Hall either directly or in the form of material assets purchased and delivered to the PUA.

Below is a brief analysis of the preliminary financial statements for 2021, presented to the consultant by the PUA Administration.

Report: Balance Sheet Analysis 2019-2021

(based on the annual balance sheets presented by the PUA)

| | She | | | Weight,% | | | Growth rate,% | |
|--|--------------------|--------------------|--------------------|-------------|-------------|-------------|---------------|-------------|
| | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2020/19 | 2021/20 |
| ACTIVE | | | | | | | | |
| Intangible assets | 20,105 | 8,320 | 2,095 | 0% | 0% | 0% | -59% | -75% |
| Tangible fixed assets | 111,464,278 | 105,074,688 | 410,202,729 | 82% | 75% | 86% | -6% | 290% |
| Long-term financial investments and other assets | 0 | 0 | 29,627,398 | 0% | 0% | 6% | 0% | 100% |
| Total Fixed Assets | 111,484,383 | 105,083,008 | 439,832,222 | 82% | 75% | 92% | -6% | 319% |
| Inventories | 6,207,198 | 5,017,960 | 7,099,740 | 5% | 4% | 1% | -19% | 41% |
| Current receivables | 17,769,161 | 4,232,083 | 4,089,067 | 13% | 3% | 1% | -76% | -3% |
| Cash | 593,676 | 26,541,105 | 26,956,285 | 0% | 19% | 6% | 4371% | 2% |
| Total Current Assets | 24,570,035 | 35,791,148 | 38,145,092 | 18% | 25% | 8% | 46% | 7% |
| TOTAL Active | 136,054,418 | 140,874,156 | 477,977,314 | 100% | 100% | 100% | 4% | 239% |
| PASSIVE | | | | | | | | |
| Social capital | 163,545,296 | 163,005,615 | 474,776,017 | 120% | 116% | 99% | 0% | 191% |
| Profit (loss) | -72,499,406 | -65,308,342 | -76,245,948 | -53% | -46% | -16% | 10% | -17% |
| Own capital | 91,045,890 | 97,697,273 | 398,530,069 | 67% | 69% | 83% | 7% | 308% |
| Long-term debt | 29,606,444 | 33,380,778 | 37,121,721 | 22% | 24% | 8% | 13% | 11% |
| Current debts | 15,402,084 | 9,796,105 | 42,325,523 | 11% | 7% | 9% | -36% | 332% |
| TOTAL Liabilities | 136,054,418 | 140,874,156 | 477,977,313 | 100% | 100% | 100% | 4% | 239% |

Fixed assets registered an impressive increase in 2021 (from 105 million lei at the end of 2020 to 410 million lei in 2021), due to the considerable increase (by 157 units) of the bus fleet, both new (100) and second hand (58).). At the same time, 26 units were taken out of use, most of them Ikarus brand extremely used and polluting. In March 2022 PUA had 205 buses, of which 125 are equipped with GPS-trackers.

Thus, the share of fixed assets in total assets increases from 75% in 2020, to 86% in 2021, but also the total assets increase from 141 million lei in 2020 to 478 million lei in 2021 - 2.4 times. The buses were bought from funds allocated directly by the City

Hall: 50 million lei were allocated in several installments for the purchase of used and refurbished buses MAN, VDL and Volvo, most of Eindhoven, the Netherlands, but also from the introduction in the statutory capital by the founder of 100 new ISUZU buses.

Also, PUA received as a gift 2 Mercedes buses from the Bucharest City Hall. In 2021, the company advanced 30 million lei to purchase 11 new buses, which were received from the City Hall already in January 2022.

Stocks and receivables are maintained at about the same level, with small variations from 2020 to 2021. The availability of funds is also maintained at a high level of over 26 million lei. In this way, the company manages the rolling stock satisfactorily, despite the significant increase in the number of buses in operation.

In 2021, the statutory capital of the enterprise was increased by almost 312 million lei by introducing in the statutory capital the value of those 100 new ISUZU buses purchased by the City Hall from the 260 million lei loan contracted at the end of 2020 from MAIB, plus the increase of statutory capital according CMC decision of 30.03.2021 by transfer of 50 million lei, mentioned above.

Long-term debts have not undergone major changes, being however in a slight increase (+ 8%, or by 3.7 million lei), which is not a cause for concern.

Short-term debts, on the other hand, increased significantly (over 4 times) in 2021 through accumulated commercial debts, amounting to 30 million lei by the end of the year.

Overall, the dynamics of the company's asset growth in 2021 was +2.4 times compared to 2020, which attests to a substantial expansion of the bus fleet and its capacity to serve passengers on existing routes and the opening of new routes.

The net assets of the enterprise registered an increase of over 4 times, up to 398.5 million lei, which come exclusively from the financing granted by the City Hall and not from its own profit.

Report: Analysis of the 2019-21 Profit and Loss Report

| She | 2019 | 2020 | 2021 | Increase,% | | Growth rate,% | |
|--|-------------|-------------|-------------|-------------|-------------|---------------|---------|
| | | | | 2020/19 | 2021/20 | 2020/19 | 2021/20 |
| Total net sales, including: | 164,704,538 | 161,155,946 | 191,281,612 | -3,548,592 | 30,125,666 | -2% | 19% |
| Sales of products and goods | 1,640,399 | 981,277 | 1,689,885 | -659,122 | 708,608 | -40% | 72% |
| Sales from the provision of services | 162,296,417 | 159,936,180 | 189,414,053 | -2,360,237 | 29,477,873 | -1% | 18% |
| Sales from other activities | 767,722 | 238,489 | 177,674 | -529,233 | -60,815 | -69% | -26% |
| Cost of sales | 146,932,767 | 135,837,508 | 182,417,757 | -11,095,259 | 46,580,249 | -8% | 34% |
| The cost of sales of goods | 1,608,218 | 1,253,631 | 585,286 | -354,587 | -668,345 | -22% | -53% |
| Cost of sales from services | 144,739,723 | 134,093,175 | 181,832,471 | -10,646,548 | 47,739,296 | -7% | 36% |
| The cost of sales of other activities | 584,826 | 490,702 | 0 | -94,124 | -490,702 | -16% | -100% |
| Gross profit | 17,771,771 | 25,318,438 | 8,863,855 | 7,546,667 | -16,454,583 | 42% | -65% |
| Gross profit, products and goods | 32,181 | -272,354 | 1,104,599 | -304,535 | 1,376,953 | -946% | 506% |
| Gross profit, services | 17,556,694 | 25,843,005 | 7,581,582 | 8,286,311 | -18,261,423 | 47% | -71% |
| Gross profit, other | 182,896 | -252,213 | 177,674 | -435,109 | 429,887 | -238% | 170% |
| Gross profit rate,% | 10.8% | 15.7% | 4.6% | 4.9% | -11.1% | 46% | -71% |
| Operational and administrative expenses: | 17,591,874 | 18,083,648 | 21,656,012 | 491,774 | 3,572,364 | 3% | 20% |
| Other operating income | 504.16 | 752,371 | 1,986,746 | 247,555 | 1,234,375 | 49% | 164% |
| Distribution costs | 16,602,499 | 13,407,323 | 8,443,458 | -3,195,176 | -4,963,865 | -19% | -37% |
| Administrative costs | 781,750 | 4,225,437 | 11,572,621 | 3,443,687 | 7,347,184 | 441% | 174% |
| Other operating expenses | 207,625 | 450,888 | 1,639,933 | 243,263 | 1,189,045 | 117% | 264% |
| Operational profit | 684,713 | 7,987,161 | -10,805,411 | 7,302,448 | -18,792,572 | 1066% | -235% |
| Financial profit (loss) | 145,705 | -1,873 | 1,065,823 | -147,578 | 1,067,696 | -101% | 57005% |
| Investment profit (loss) | -68,927 | -1,055,458 | 797,397 | -986,531 | 1,852,855 | -1431% | 176% |
| Profit (loss) from other activities | 76,778 | -1,057,331 | 1,863,220 | -1,134,109 | 2,920,551 | -1477% | 276% |
| Profit up to tax | 761,491 | 6,929,830 | -8,942,191 | 6,168,339 | -15,872,021 | 810% | -229% |

| | | | | | | | |
|-------------------------|---------|-----------|------------|-----------|-------------|------|-------|
| Income tax | 147,547 | 278,447 | 0 | 130,900 | -278,447 | 89% | -100% |
| Net profit for the year | 613,944 | 6,651,383 | -8,942,191 | 6,037,439 | -15,593,574 | 983% | -234% |

Sales increased in 2021 by 19% due to the increased transport capacity of passengers with the new buses, which were delivered during the year in batches and put on routes once completed with drivers and drivers (tax collectors). The decrease in the number of failures also contributed to the increase in the volume of services provided and receipts. At the same time, the cost of sales increased by 34%, mainly due to the significant increase in fuel prices, all materials and parts in 2021, well above the basic indices approved by the CMC on 29.12.2020 for 2021. This led to a decrease of 16.4 million lei, or 65% of the gross profit of the PUA. This fact, together with the significant increase in operational and administrative expenses (+ 20%, or 3.6 million lei), led to reported operating losses of almost 11 million lei in 2021, after a profit of 8 million lei obtained in 2020.

Other increasing operating revenues, 2 million lei (+ 164%) are mainly due to revenues from the sale of scrap metal (over 1 million lei), scrapped batteries, and re-calculations for car insurance premiums.

Other operating expenses also increased (+ 264%), mainly due to negative differences in the purchase of foreign currency for the payment of used buses, the costs of dismantling and handing over recyclable materials.

The significant increase of administrative expenses is due to the correction in 2021 and 2021 of the errors previously admitted in the accounting of these expenses. Thus, a large part was previously reported as commercial expenses. In total, the expenses of the period increased by 3.5 million lei, or 20%, mainly due to the increase of the average level of salaries of administrative and auxiliary staff, but also of the maintenance costs of the properties.

Thus, the net loss of the PUA for 2021 amounted to 8.9 million lei, according to the unheard financial report, presented by the PUA management on 24.02.2022. Figures may change until final reporting. However, the financial result is well below the normative rate of return of 5%.

Report: Cash Flow Analysis 2019-2021

| Indicators, you | 2019 | 2020 | 2021 | Increase,% | | Growth rate,% | |
|---|-------------|--------------|-------------|--------------|--------------|---------------|---------|
| | | | | 2020/19 | 2021/20 | 2020/19 | 2021/20 |
| <i>OPERATIONAL ACTIVITY</i> | | | | | | | |
| Sales receipts | 154,440,064 | 32,492,463 | 187,857,576 | -121,947,601 | 155,365,113 | -79% | 478% |
| Payments for stocks and services purchased | 80,462,039 | 57,497,218 | 88,473,268 | -22,964,821 | 30,976,050 | -29% | 54% |
| Cash payments to employees and contributions to CAS | 71,377,802 | 73,984,484 | 96,697,282 | 2,606,682 | 22,712,798 | 4% | 31% |
| Income tax payment | 0 | 149,380 | 2,190,600 | 149,380 | 2,041,220 | 100% | 1366% |
| Other receipts | 152,108 | 404,682 | 4,048,195 | 252,574 | 3,643,513 | 166% | 900% |
| Other payments | 2,079,719 | 6,773,296 | 9,536,180 | 4,693,577 | 2,762,884 | 226% | 41% |
| Net MB flow from operating activity | 672,612 | -105,507,233 | -4,991,559 | -106,179,845 | 100,515,674 | -15,786% | 95% |
| <i>INVESTMENT ACTIVITY</i> | | | | | | | |
| Payments related to fixed assets inflows | 79,414,848 | 0 | 48,313,396 | -79,414,848 | 48,313,396 | -100% | 100% |
| Other receipts (payments) | 0 | 3,792,989 | 50,000,000 | 3,792,989 | 46,207,011 | 100% | 1218% |
| MB net flow from investment activity | -79,414,848 | 3,792,989 | 1,686,604 | 83,207,837 | -2,106,385 | 105% | -56% |
| <i>FINANCIAL ACTIVITY</i> | | | | | | | |
| Proceeds from capital operations | 78,509,547 | 0 | 0 | -78,509,547 | 0 | -100% | 0% |
| Other receipts (payments) | 0 | 127,661,673 | 5,479,110 | 127,661,673 | -122,182,563 | 100% | -96% |
| MB net flow from financial activity | 78,509,547 | 127,661,673 | 5,479,110 | 49,152,126 | -122,182,563 | 63% | -96% |
| Total net flow | -232,689 | 25,947,429 | 2,174,155 | 26,180,118 | -23,773,274 | 11,251% | -92% |
| Course differences | -76,610 | 0 | -1,758,975 | 76,610 | -1,758,975 | -100% | 100% |

| | | | | | | | |
|--|---------|------------|------------|------------|------------|-------|-------|
| MB balance at the beginning of the period | 902,975 | 593,676 | 26,541,105 | -309,299 | 25,947,429 | -34% | 4371% |
| MB balance at the end of the management period | 593,676 | 26,541,105 | 26,956,285 | 25,947,429 | 415,180 | 4371% | 2% |

The seemingly insufficient revenues in 2020 and their increase in 2021 4.8 times are due to errors (of funding item in the budget) in the allocation of revenues from the City Hall in 2020, which were subsequently corrected.

Sufficient liquidity reserves in the bank account during the years 2020-2021 were maintained mainly for the timely payment of salaries for December. However, credit debts increased at the end of 2021 due to the high price of fuels and parts.

Overall, the cash flow situation improved during the years 2020-2021, but towards the end of 2021 a cash deficit was formed for the payment with fuel suppliers due to the substantial exceeding of costs compared to the values approved and financed by CMC.

Report: Balance sheet indicators, evolution 2019-2021

| indicator | 2019 | 2020 | 2021 |
|--|------|------|-------|
| Current liquidity | 1,6 | 3,7 | 0,9 |
| Intermediate liquidity | 1,2 | 3,1 | 0,7 |
| General solvency ratio | 9 | 14 | 11 |
| Debt rotation, days | 39 | 10 | 8 |
| Stock rotation, days | 15 | 13 | 14 |
| Rotation of credit debts, days | 34 | 22 | 81 |
| Interest coverage capacity | 0 | 0 | 0 |
| The share of MoF in the structure of Equity | 1,22 | 1,08 | 1,03 |
| Gross debt ratio | 0,5 | 0,4 | 0,2 |
| Financial rate of return (Equity) | 0,7% | 6,8% | -2,2% |
| Investment payback period | 148 | 15 | -45 |
| Rate of return (assets) | 0,5% | 4,7% | -1,9% |
| MF exploitation coefficient | 1,5 | 1,5 | 0,5 |
| Coefficient of the number of asset rotations | 1,2 | 1,1 | 0,4 |

Liquidity indicators, although fluctuating quite a lot and reaching sub-unit values at the end of 2021, are still within the admissible limits and attest to the lack of the immediate risk of insolvency. This is due to the guaranteed allowances from the City Hall. The overall solvency ratio is within acceptable limits for a business, but the risks are low only due to the good solvency of the founder. The company has a very good debt rotation in the last 2 years, less than 10 days, and the stock turnover is stable at 13-14 days, which is a good indicator. However, the rotation of credit debts shows a markedly negative trend - it increased to 81 days (30 million lei in current commercial debts and indicates difficulties in paying suppliers at the end of 2021, when fuels became essentially more expensive.

The share of MF in the Equity structure is super-unitary, because the company does not need significant Working Capital, and the cash turnover cycle is very short, which benefits the business. It could be even better if the company managed to sell more monthly subscriptions, instead of simple tickets. The Gross Debt Rate is low (0.2 in 2020) and declining, even though current debt has increased significantly in 2021.

The rate of return on equity, but also on assets, reached negative values in 2021 due to reported losses for the period.

The exploitation coefficient of MF, which had a very good value in 2019 and 2020, decreased to a modest level of 0.5 due to the massive renewal of the park, which has not yet led to a significant increase in sales and this fact must motivate the PUA administration to review the routes and schedules, in order to increase the bus utilization rate on the existing routes.

II.1.2. Directed by Electric Transport Chisinau

Below is the preliminary report of the main economic indicators, presented to the consultant by the RTEC administration and the indicators approved by the CMC for RTEC for 2021.

Report: RTEC economic activity indicators in 2021

| Nr. do | Name of articles | United measure | FAPT indicators reported by RTEC | | PLAN approved by CMC |
|--------|---|---------------------|----------------------------------|-------|----------------------|
| 1 | Trolleybus departure on working days | unity | 330 | | 321 |
| 2 | Total trolleybus route | thousand km | 21,878.6 | | 21,000.0 |
| 3 | Total income, including: | thousand lei | 516,920.8 | | 501,900.0 |
| | -come according to the contract with CSP | thousand lei | 314,300.0 | | 310,000.0 |
| | -come from passenger transport | thousand lei | 202,620.8 | | 191,900.0 |
| | -come from the sale of subscriptions | thousand lei | 25,802.1 | | n / p |
| | Expenses - in total | thousand lei | 566,907.0 | | 535,700.0 |
| | Inclusive: | | The amount | % | The amount |
| 4 | Basic activity expenses, including: | thousand lei | 564,107.0 | 100% | 478,000.0 |
| | materials at rep. and often. m / rolling | thousand lei | 41,745.4 | 7.4% | n / p |
| | electricity | thousand lei | 66,343.6 | 11.8% | n / p |
| | remuneration for work | thousand lei | 299,719.8 | 53.1% | 345,000.0 |
| | social fund | thousand lei | 71,933.1 | 12.8% | n / p |
| | wear and tear of fixed assets | thousand lei | 66,450.0 | 11.8% | n / p |
| | Comunal services | thousand lei | 2,905.2 | 0.5% | n / p |
| | taxes and fees, banking services | thousand lei | 1,875.6 | 0.3% | n / p |
| | other expenses, including | thousand lei | 13,134.3 | 2.3% | n / p |
| | insurance of trolls, allowances for bulletins | thousand lei | 6,520.1 | | n / p |
| 5 | Expenditure taken into account v-km cost | thousand lei | 544,651.8 | | 501,900.0 |
| 6 | Normative profitability | thousand lei | 28,205.4 | | 23,900.0 |
| 7 | Total transport volume, including: | thousand passengers | 121,073.9 | | 117,435.3 |
| | a) with payment: | thousand passengers | 111,006.8 | | 107,945.5 |
| | - tickets | thousand passengers | 88,409.4 | | n / p |
| | - subscription | thousand passengers | 22,567.5 | | n / p |
| | b) with facilities: | thousand travels | 10,067.1 | | n / p |
| 8 | The cost of transporting a passenger | lei | 4.50 | | 4.27 |
| 9 | The cost of a vehicle-kilometer | lei | 24.89 | | 23.90 |
| 10 | Average travel fare | lei | 1.83 | | 1.78 |
| 11 | Coverage of costs with the tariff collected | % | 41% | | 42% |

We notice a slightly negative performance in terms of cost of a vehicle-kilometer, which was 1 lei (or 4.2%) higher than the value approved by CMC, and half of this excess is due to higher salary costs than the plan. However, there were more trolleybuses on routes compared to the plan (with 9 units on average), the total turnover was higher (by 879 thousand km, or 4.2%) and higher costs by 42.8 million lei, or 8.5%. Revenues from ticket sales were lower than the plan by 10.7 million lei (5.6%), but also travel was 3.6 million more than the plan approved by CMC.

As a result of a total turnover higher than the plan, the expenses were also higher by 86 million lei, or 18%, and those included in the tariff calculation by 43 million lei, or 8.5%.

In 2021, RTEC covered only 202.6 million lei in sales costs, the rest being financed from City Hall allocations (314.3 million lei, versus the 310 million lei plan). Even at RTEC, the sales did not even cover the salary costs, not to mention the investments. The phenomenon is due to outdated tariffs for urban, newer and suburban travel, which are not even higher than urban ones, regardless of much higher costs (longer distances, higher energy consumption, higher battery trolleybus cost). However, the indicators of RTEC's activity in 2021 are better than those of PUA in the same year - the average cost of one km was at RTEC 24.89 lei versus 27.97 lei at PUA). The situation is due to the much lower cost per kilometer of fuel used: RTEC spent on average 3.03 lei per km for electricity (at which the tariff was stable), while PUA - 5.97 lei per km for fuel and lubricants, which registered essential increases during 2021. In 2022 the situation will change here as well, due to the increase in electricity prices from 01.04.2022.

The result is that RTEC has managed to cover 41% of the cost of transporting a passenger from the fare charged, versus 42% planned, which is much more than 23% at the PUA, although the standard bus fare is 50% higher than the trolleybus fare. Below is the analysis of the preliminary financial statements, presented to the consultant by the RTEC administration.

Report: Balance Sheet Analysis 2019-2021
(based on the annual balance sheets presented by RTEC)

| ACTIVE | She | | | Weight | | | Growth rate | |
|--|--------------|--------------|--------------|--------|------|------|-------------|---------|
| | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2020/19 | 2021/20 |
| Intangible assets | 30,595 | 32,198 | 202,465 | 0% | 0% | 0% | 5% | 529% |
| Tangible fixed assets | 627,950,327 | 618,898,796 | 698,646,909 | 89% | 81% | 84% | -1% | 13% |
| Long-term financial investments and other assets | 0 | 0 | 0 | 0% | 0% | 0% | 0% | 0% |
| Total Fixed Assets | 627,980,922 | 618,930,994 | 698,849,374 | 89% | 81% | 84% | -1% | 13% |
| Inventories | 10,600,213 | 19,026,053 | 43,208,603 | 2% | 2% | 5% | 79% | 127% |
| Current receivables | 64,757,498 | 107,877,110 | 68,983,701 | 9% | 14% | 8% | 67% | -36% |
| Cash | 1,871,455 | 17,224,050 | 21,338,597 | 0% | 2% | 3% | 820% | 24% |
| Total Current Assets | 77,229,166 | 144,127,213 | 133,530,901 | 11% | 19% | 16% | 87% | -7% |
| TOTAL Active | 705,210,088 | 763,058,207 | 832,380,275 | 100% | 100% | 100% | 8% | 9% |
| PASSIVE | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2020/19 | 2021/20 |
| Social capital | 302,920,441 | 302,920,441 | 316,845,441 | 43% | 40% | 38% | 0% | 5% |
| Profit (loss) | -131,455,365 | -133,234,013 | -119,112,135 | -19% | -17% | -14% | -1% | 11% |
| Reserves and other capital items | 452,503,620 | 455,411,556 | 522,313,835 | 64% | 60% | 63% | 1% | 15% |
| Own capital | 623,968,696 | 625,097,984 | 720,047,141 | 88% | 82% | 87% | 0% | 15% |
| Long-term debt | 11,329,705 | 86,781,998 | 65,800,000 | 2% | 11% | 8% | 666% | -24% |
| Current debts | 69,911,687 | 51,178,225 | 46,533,134 | 10% | 7% | 6% | -27% | -9% |
| TOTAL Liabilities | 705,210,088 | 763,058,207 | 832,380,275 | 100% | 100% | 100% | 8% | 9% |

Total fixed assets increased in 2021 by 13%, due to the increase (by 80 million lei and 40 units) of the trolleybus fleet, of which 10 were assembled in Moldova. At the same time, 2 used units were scrapped. Intangible assets increased 6 times due to the acquisition and implementation of the 1C accounting program. Thus, the share of fixed assets in total assets reaches 84% in 2021, and total assets increase from 763 million lei in 2020 to 832 million lei in 2021, ie by 9%. The trolleybuses were bought from funds allocated directly by the City Hall in 2021 (94 million lei), as a contribution to the statutory capital.

Current assets decreased from 144 million lei in 2020 to 134 million lei in 2021, the stocks of materials increasing significantly, by over 23 million lei, because the stocks included the value of bodies imported from Belarus to be assembled in the first quarter of year 2022, but the advances granted decreased significantly (by 38 million lei) so that in total, the evolution of current assets is slightly decreasing. The availability of funds was at a satisfactory level (over 20 million lei) at the end of 2021. The company prudently manages its working capital.

During 2021, the equity capital increased by 95 million lei due to the registered profit of 19 million lei, but also to the increase by 14 million lei of the statutory capital from the purchase of 2 trolleybuses in Italy.

Long-term debts decreased by 21 million lei (24%) as a result of the repayment of the final installment of the EBRD loan, the last installment of which was paid in September 2020.

Short-term debts decreased by 4.6 million lei (9%) mainly due to the loan repayment of 10 million lei, but debts regarding the remuneration of employees increased by 5 million lei.

Overall, the growth dynamics of the company's assets was positive, + 9% compared to 2020.

Report: Analysis of the profit and loss report 2019-21

| She | 2019-21 | | | Increase,% | | Growth rate,% | |
|--|-------------|-------------|-------------|------------|-------------|---------------|----------|
| | 2019 | 2020 | 2021 | 2020/19 | 2021/20 | 2020/19 | 2021/20 |
| Total net sales, including: | 448,202,429 | 459,166,762 | 519,050,128 | 10,964,333 | 59,883,366 | 2% | 13% |
| Sales from the provision of services | 447,507,657 | 458,604,186 | 519,050,128 | 11,096,529 | 60,445,942 | 2% | 13% |
| Sales from other activities | 694,772 | 562,576 | 0 | -132,196 | -562,576 | -19% | -100% |
| Cost of sales | 432,092,048 | 422,774,907 | 486,595,192 | -9,317,141 | 63,820,285 | -2% | 15% |
| Cost of sales from services | 432,092,048 | 422,774,907 | 486,595,192 | -9,317,141 | 63,820,285 | -2% | 15% |
| The cost of sales of other activities | 0 | 0 | 0 | 0 | 0 | 0% | 0% |
| Gross profit | 16,110,381 | 36,391,855 | 32,454,36 | 20,281,474 | -3,936,919 | 126% | -11% |
| Gross profit, services | 15,415,609 | 35,829,279 | 32,454,936 | 20,413,670 | -3,374,343 | 132% | -9% |
| Gross profit, other | 694,772 | 562,576 | 0 | -132,196 | -562,576 | -19% | -100% |
| Gross profit rate,% | 3.6% | 7.9% | 6.3% | 4.3% | -1.7% | 120% | -21% |
| Operational and administrative expenses: | 26,505,105 | 47,988,271 | 28,473,753 | 21,483,166 | -19,514,518 | 81% | -41% |
| Other operating income | 12,503,958 | 9,947,241 | 9,192,723 | -2,556,717 | -754,518 | -20% | -8% |
| Distribution costs | 652,810 | 495,832 | 519,467 | -156,978 | 23,635 | -24% | 5% |
| Administrative costs | 16,899,949 | 15,880,221 | 20,017,620 | -1,019,728 | 4,137,399 | -6% | 26% |
| Other operating expenses | 8,952,346 | 31,612,218 | 7,936,666 | 22,659,872 | -23,675,552 | 253% | -75% |
| Operational profit | 2,109,234 | -1,649,175 | 13,173,906 | -3,758,409 | 14,823,081 | -178% | 899% |
| Financial profit (loss) | -543,122 | 1,235,298 | 7,761,016 | 1,778,420 | 6,525,718 | 327% | 528% |
| Investment profit (loss) | 1,099,330 | 408,667 | 0 | -690,663 | -408,667 | -63% | -100% |
| Profit (loss) from other activities | 556,208 | 1,643,965 | 7,761,016 | 1,087,757 | 6,117,051 | 196% | 372% |
| Profit up to tax | 2,665,442 | -5,210 | 20,934,922 | -2,670,652 | 20,940,132 | -100% | 401,922% |
| Income tax | 0 | 0 | 0 | 0 | 0 | 0% | 0% |
| Net profit for the year | 2,665,442 | -5,210 | 20,934,922 | -2,670,652 | 20,940,132 | -100% | 401,922% |

Sales increased in 2021 by 60 million lei, or 13% due to the increased transport capacity of passengers with the new trolleybuses, which were either assembled on the spot or imported. The cost of sales increased more, by 15%, the gross profit decreasing by 3.9 million lei compared to 2020 (or 11%), up to 32.4 million lei.

Other operating income includes income from the location of electric poles, from advertising placed on trolleybuses, from the activity of the medical center Călătorul (owned), other income.

Administrative expenses increased by 26%, or by over 4 million lei, as a result of the extraordinary costs related to COVID-19 (consumables and disinfectant), the increase of salaries, but also the costs related to the maintenance of real estate.

Other operating expenses decreased significantly from 2020, by 23.7 million lei, as a result of the cancellation in 2020 of the receivables of previous years not recognized by the General Directorate of Public Transport and Communications. These factors together led to an increase in operating profit to 13.2 million lei, after losses of 1.6 million lei in 2021.

The financial profit of 7.8 million lei was obtained mainly from the positive exchange rate differences. Thus, the profit until taxation of 2021 amounts to almost 21 million lei, or 4% according to the unaudited preliminary report, presented by the RTEC administration.

Report: Cash Flow Analysis 2019-2021

| indicator | 2019 | 2020 | 2021 | growth | | Growth rate | |
|--|--------------|--------------|--------------|--------------|-------------|-------------|---------|
| | | | | 2020/19 | 2021/20 | 2020/19 | 2021/20 |
| <i>OPERATIONAL ACTIVITY</i> | | | | | | | |
| Sales receipts | 229,837,619 | 156,618,619 | 203,249,415 | -7., 219,000 | 46,630,796 | -32% | 30% |
| Payments for purchased stocks and services | 111,952,000 | 129,301,818 | 138,975,625 | 17,349,818 | 9,673,807 | 15% | 7% |
| Cash payments to employees and contributions for CAS | 288,191,170 | 299,310,908 | 340,938,371 | 11,119,738 | 41,627,463 | 4% | 14% |
| Income tax payment | 1,749,538 | 858,240 | 295,118 | -891,298 | -563,122 | -51% | -66% |
| Other receipts | 16,702,226 | 12,680,779 | 14,140,084 | -4,021,447 | 1,459,305 | -24% | 12% |
| Other payments | 30,645,969 | 29,880,256 | 34,641,192 | -765,713 | 4,760,936 | -2% | 16% |
| <i>Net MB flow from operating activity</i> | -185,998,832 | -290,051,824 | -297,460,807 | -104,052,992 | -7,408,983 | -56% | -3% |
| <i>INVESTMENT ACTIVITY</i> | | | | | | | |
| Payments related to fixed assets inflows | 76,463,129 | 132,722,582 | 94,084,219 | 56,259,453 | -38,638,363 | 74% | -29% |
| Other receipts (payments) | 72,000,103 | 127,833,889 | 94,075,133 | 55,833,786 | -33,758,756 | 78% | -26% |
| <i>MB net flow from investment activity</i> | -4,463,026 | -4,888,693 | -9,086 | -425,667 | 4,879,607 | -10% | 100% |
| <i>FINANCIAL ACTIVITY</i> | | | | | | | |
| Receipts in the form of credits and loans | 48,212,400 | 37,474,163 | 1,800,000 | -10,738,237 | -35,674,163 | -22% | -95% |
| Credit and loan payments | 59,782,057 | 49,356,596 | 11,800,000 | -10,425,461 | -37,556,596 | -17% | -76% |
| Other receipts (payments) | 200,510,000 | 322,090,800 | 311,481,083 | 121,580,800 | -10,609,717 | 61% | -3% |
| <i>MB net flow from financial activity</i> | 188,940,343 | 310,208,367 | 301,481,083 | 121,268,024 | -8,727,284 | 64% | -3% |
| Total net flow | -1,521,515 | 15,267,850 | 4,011,190 | 16,789,365 | -11,256,660 | 1103% | -74% |
| Course differences | 144,472 | 84,745 | 103,357 | -59,727 | 18,612 | -41% | 22% |
| MB balance at the beginning of the period | 3,248,498 | 1,871,455 | 17,224,050 | -1,377,043 | 15,352,595 | -42% | 820% |
| MB balance at the end of the management period | 1,871,455 | 17,224,050 | 21,338,597 | 15,352,595 | 4,114,547 | 820% | 24% |

The company has a relatively stable cash flow and sufficient cash during the period under review.

The investment activity (94 million lei in 2021 paid for fixed assets) takes place practically entirely from the financing of the City Hall for the purchase and assembly of trolleybuses.

The company has been actively credited during the last years, and in 2021 it paid the last loan of 10 million lei from its own sources. The company had sufficient liquidity

reserves in the bank account during the years 2020 and 2021, to pay its current debts on time and loans contracted in previous years.

Report: Balance sheet indicators, evolution 2019-2021

| Indicator | 2019 | 2020 | 2021 |
|--|------|---------|------|
| Current liquidity | 1.1 | 2.8 | 2.9 |
| Intermediate liquidity | 1.0 | 2.4 | 1.9 |
| General solvency ratio | 10 | 15 | 18 |
| Debt rotation, days | 53 | 86 | 49 |
| Stock rotation, days | 9 | 16 | 32 |
| Rotation of credit debts, days | 57 | 41 | 33 |
| Interest coverage capacity | 1.5 | 0.0 | 71 |
| The share of MoF in the structure of Equity | 1.01 | 0.99 | 0.97 |
| Gross debt ratio | 0.13 | 0.22 | 0.16 |
| Financial rate of return (Equity) | 0.4% | 0.0% | 2.9% |
| Investment payback period | 234 | -119,98 | 34 |
| Rate of return (assets) | 0.4% | 0.0% | 2.5% |
| MF exploitation coefficient | 0.7 | 0.7 | 0.7 |
| Coefficient of the number of asset rotations | 0.6 | 0.6 | 0.6 |

Liquidity and solvency indicators are increasing over the period under review and well above the adequacy thresholds, and together with a high overall solvency ratio (18), there is no risk of insolvency, but this is due to the allowances received (guaranteed) from City Hall. The company has a relatively unfavorable receivables rotation of 49 days, due to significant advances for trolleybus assembly parts, and inventory turnover increased from 9 days in 2019 to 33 days in 2021 due to significant inventory increases in 2021, until to 41 million lei (from 17 million lei in 2020), also due to the sets for assembling trolleybuses.

The credit debt rotation has a tendency to accelerate, although it is still quite high, at 33 days. The MF's share in the Equity structure is practically 1:1, the company does not need significant Working Capital, because the cash turnover cycle is quite short. For the same reason, the Gross Debt Rate is low - 0.16 in 2021.

The rate of return on equity, but also on assets, reached negative values in 2020 due to reported losses, but in 2021 a profit of over 21 million lei was obtained, or 4% and a rate of return on equity of 2.9 %.

The operating coefficient of the MF is stable (0.7), a fairly good value taking into account the active renewal of the trolleybus fleet during the analyzed period.

II.2 Conclusion on the analysis of PUA and RTEC performances

The economic indicators of RTEC in 2021, but also in previous years, are significantly better and more uniform than those of PUA, due to lower costs per kilometer traveled,

which is also due to the much higher volumes of RTEC activity. This allows the achievement of a certain operational efficiency, but also more predictable costs due to the more stable tariff for electricity. RTEC is also a better employer, thanks to more developed work infrastructure, career advancement opportunities and rest facilities for its employees.

RTEC and PUA received in 2021 cumulative subsidies amounting to 462.3 million lei to cover operating costs, slightly above the amount provided (458 million lei), plus another over 300 million lei that were allocated by the City Hall for the purchase of vehicles, mainly new buses. Thus, the financing from the budget in 2021 reached the amount of over 760 million lei and is increasing sharply for 2022, along with the substantial increase in diesel and electricity prices, plus significant inflation for other cost items. The cost increases threaten both enterprises with bankruptcy in 2022 and create a significant financial burden for the budget of Chisinau.

Both companies are far from profitable, for reasons beyond their control, but RTEC has a much better performance in 2021. Therefore, in the case of the merger of the two municipal transport companies, it is advisable for RTEC to absorb PUA, creating that resulting in a single municipal transport company, as is practiced in most European cities. This would allow the maintenance and application of more efficient management practices of a municipal transport company with several parks and facilities for servicing, repair, dispatching, ticket trade and single subscriptions within an electronic payment system.

Also, a single municipal enterprise would allow a more complex assessment of the needs and evolution of passenger flows in the city and suburbs, the development and more efficient implementation of public transport development policies. Otherwise, the flow of passengers will continue to decline in favor of individual transport.

II.3. Analysis of costs by categories and type and determination of savings in case of merger

At the request of the consultant, PUA presented the real costs of 2021 on expenditure items grouped by basic categories:

- ✓ Direct expenses for the provision of transport services;
- ✓ Vehicle maintenance costs;
- ✓ Administrative costs;
- ✓ Other costs.

For 2021 over 66% of consumption was direct, 24.3% - related to vehicle maintenance, 4.9% were administrative expenses and 4.5% were spent on service compensation Valindicoma and COVID-related expenses 19.

To measure the potential cost savings from the merger of RTEC and PUA, the consultant analyzed the costs per km traveled by PUA, as they are the most relevant in assessing the operational efficiency of public transport operators. PUA is the subject of the analysis due to the higher level of costs per km traveled and the proposal to be

absorbed by RTEC in the event of a merger. In this case, most of the savings will be made from optimizing PUA costs, in several ways:

- reducing the length of routes with the introduction of line ends in the nodal points (which could save 14.5% of the annual turnover of the bus fleet);
- unification of dispatching services by creating a single traffic control point; its location could be within one of the 4 parks;
- reduction of staff in several structural subdivisions with currently doubled activities, such as: human resources service, forecasting and economic analysis service, accounting service, IT service, legal service, commercial service (marketing and sales), but also support and social subdivisions (medical and food complex);
- unification of rapid technical assistance teams, as some chassis-related work, including towing damaged vehicles, could be carried out by universal teams;
- the total elimination of taxpayers at both companies, with the implementation of an electronic taxation system (which, however, is not conditioned by the merger of companies and must be done anyway);
- significant reduction in the number of workers engaged in servicing, maintenance and washing of vehicles, due to the replacement of a substantial part of the buses in 2021 and the permanent renewal of the trolleybus fleet.

At the same time, certain teams will be further strengthened and trained: the internal control service, which will have to be supplemented with staff, the dispatched service within the single traffic control point, which will also require the implementation of a traffic management program.

The organization of some ends of routes/returns in nodal points on an inner perimeter proposed in this report would bring savings at the level of variable expenses of the PUA bus fleet (reduction by 1.17 million km, or by 14.5% of the annual turnover calculated), if the released buses would not be allocated to new routes, or to supplement existing routes. Some of the costs are variable and could be reduced with the implementation of these changes. The savings from this set of measures have been calculated based on the current costs of the PUA in 2021 and are presented in the table below:

Table no. 15: Bus operating costs and possible reductions in route changes

| Bus operating cost items in 2021 | Fixed cost/ var | Current cost, thousands of lei | Cost/km, lei | Optimized cost |
|--|-----------------|--------------------------------|--------------|----------------|
| Vehicle operating costs: | | | | |
| With direct labor (drivers + tax collectors) | F | 60,416 | 7.47 | 60,416 |
| With fuel, lubricants and oil | V | 46,159 | 5.71 | 39,477 |
| Fleet amortization | F | 15,806 | 1.96 | 15,806 |
| Vehicle insurance | F | 424 | 0.05 | 424 |
| Tires and tubes | V | 1,883 | 0.23 | 1,610 |
| Costs of bus and trolleybus stations | F | 0 | 0.00 | 0 |
| Other operating expenses of vehicles. (parts, materials) | V | 8,346 | 1.03 | 7,138 |
| Vehicle maintenance costs: | | | | |

| | | | | |
|---|---|----------------|--------------|----------------|
| With labor (repair and maintenance services) | F | 39,316 | 4.86 | 39,316 |
| Maintenance materials | V | 1,801 | 0.22 | 1,540 |
| Fleet amortization | F | 1,234 | 0.15 | 1,234 |
| Tires and tubes | F | 65 | 0.01 | 65 |
| Vehicle insurance | F | 279 | 0.03 | 279 |
| Other consumables | V | 2,055 | 0.25 | 1,757 |
| Exterior maintenance | F | 100 | 0.01 | 100 |
| Auxiliary vehicle maintenance | F | 880 | 0.11 | 880 |
| Other maintenance costs | F | 3,067 | 0.38 | 3,067 |
| Administrative and management costs: | | | | |
| With labor (management) | F | 7,691 | 0.95 | 7,691 |
| Office supplies | F | 36 | 0.00 | 36 |
| Software - licenses | F | 6 | 0.00 | 6 |
| Telephony and mail | F | 47 | 0.01 | 47 |
| Maintenance of administrative vehicles | F | 33 | 0.00 | 33 |
| Combustible | F | 28 | 0.00 | 28 |
| Fleet amortization | F | 130 | 0.02 | 130 |
| Vehicle insurance | F | 4 | 0.00 | 4 |
| Maintenance materials | F | 88 | 0.01 | 88 |
| Education | F | 0 | 0.00 | 0 |
| Exterior maintenance | F | 953 | 0.12 | 953 |
| Other management and administrative expenses | F | 806 | 0.10 | 806 |
| Other cost categories used in the enterprise: | | | | |
| COVID-19 expenses | V | 548 | 0.07 | 469 |
| Valindicom expenses (route 23) | F | 8,443 | 1.04 | 8,443 |
| TOTAL COSTS | | 200,645 | 24.82 | 191,845 |
| Total annual turnover, km | | 8,082,670 | 24.82 | 6,912,670 |
| Savings, thousands of lei | | | | 8,800 |

The application of optimization measures on the 9 suburban bus lines, proposed by the consultant (5 reduced and 4 abolished), would reduce the annual journey by 14.5%, and the possible savings amount to almost 9 million lei (or 4.4% of annual costs) in 2021. With the significant increase in the average price of diesel and other materials (already 50%) in 2022, possible savings could easily exceed 30 million lei per year, or 15% of PUA costs, which it is significant for the municipal budget.

The implementation of the optimization measures of the administrative staff, tax collectors, workers, proposed in the report would produce positive effects at the level of salary costs of the merged enterprise, which amounts to over 100 million lei only in the first year after the merger. At the same time, we took into account the increase in the number of reviewers (up to 150 people), to check tickets and passenger season tickets, hiring staff in the Single Control Center (162 people), but also the salary costs of redundant staff (891 people in total) during 3 months, as provided by the legislation of the Republic of Moldova. The table below shows the calculation of possible savings from the reorganization of staff in terms of salaries and staff in 2021. In the coming years, savings would increase to 125 million lei due to lack of salary obligations to employees fired as a result of the merger.

Table no. 16: Salary savings from the merger of RTEC with PUA, the first year after the merger

| Indicators | United. measure | RTE | PUA | RTE Merged | Optimizati ons / costs | |
|--|-----------------|-----------------|--------------|--------------|---------------------------|--------------|
| Total staff | people | 2,475 | 887 | 2,471 | 891 | |
| Drivers | people | 661 | 285 | 946 | 0 | |
| Conductors | people | 688 | 274 | 0 | 962 | |
| Auditors, Controllers | people | 36 | 10 | 150 | -104 | |
| Single Control Center | people | 0 | 0 | 162 | -162 | |
| Specialists and officials | people | 340 | 104 | 356 | 88 | |
| Workers | people | 750 | 214 | 857 | 107 | |
| Salary costs first year | | | | | | |
| | | mon ths | | | | |
| Drivers | Mil. lei | 12 ¹ | 87,3 | 46,2 | 133,4 | 0.0 |
| Conductors | Mil. lei | 12 ¹ | 78,4 | 45,9 | 0.0 | 124,3 |
| Auditors, Controllers | Mil. lei | 12 ¹ | 2,8 | 1,2 | 15,3 | -11,2 |
| Single Control Center | Mil. lei | 12 ¹ | 0.0 | 0.0 | 19,4 | -19,4 |
| Specialists and officials | Mil. lei | 12 ¹ | 44,9 | 8,7 | 46,2 | 7,4 |
| Workers | Mil. lei | 12 ¹ | 72,0 | 15,4 | 79,7 | 7,7 |
| With staff fired | Mil. lei | 3 ¹ | 0.0 | 0.0 | 26,7 | -26,7 |
| CAS and CAM to salaries | Mil. lei | 24% | 68,5 | 28,2 | 77,0 | 19,7 |
| Annual COST first year after merger | Mil. lei | | 353,9 | 145,6 | 397,8 | 101,7 |

Reducing the staffing of both companies could also lead to savings in the cost of maintaining administrative buildings, but it is difficult to assess them without clarity on the location of the merged company's unified services, but they are likely to be offset by the Single Center's operating costs of Traffic Control, which could be located in the vacant spaces of the PUA administrative building. The cost of training the staff of the Single Control Center cannot be appreciated at this moment, but also the cost of licensing and implementing a high-performance traffic monitoring program, but these will be investments reflected in operating expenses only through depreciation.

Reductions in production and ancillary space maintenance costs at all 4 parks are not expected, as the level of activity will not suffer as a result of the merger.

Thus, the merger could lead to savings of 110 million lei in the first year, and 134 lei annually starting with the second year, and this represents respectively 13.7% and 16.9% of the total combined costs (793 million lei) of enterprises for 2021. Given the substantial increase in salaries at the PUA (by 20% on average) in 2022, the absolute savings would be even higher, even if the staff remaining at the merged company will receive some additional tasks and some supplements to the official salary.

II.4. Analysis of the financial aspects of the merger of PUA and RTEC

II.4.1. Economic substantiation of the merger

If CMC accepts the merger of the two companies, the optimal procedure would be the merger by absorption by RTEC of PUA, RTEC being significantly higher in number and value of assets, level of operations and having a better financial situation during current.

The merger in this case aims to ensure the conditions for sustainable development, by financial consolidation and reducing pressure on the local budget, while increasing the quality and attractiveness of public transport, reducing urban congestion and emissions in Chisinau. The main reasons for the decision of the common founder are the following:

- ✓ Reducing the pressure on the local budget, by:
 - reduction of operating costs;
 - increase revenues, within socially acceptable rates.
- ✓ Ensuring the coherence of public transport operation at the level of routes and fares, by:
 - route optimization, with the elimination of parallels and the organization of line ends at nodal points, with transshipment from buses on suburban routes to trolleybuses;
 - the application of a unique and diversified fare offer, better adapted to transport habits and to benefit loyal passengers, by offering substantial advantages when buying season tickets.
- ✓ Implementation of an integrated business system, based on direct operating costs and those of administration, social service and labor protection, maintenance of infrastructure, troubleshooting facilities and transport units;
- ✓ Ensuring sustainable development, by optimizing and regulating processes at the level of the merged organization, including strategic planning, which can be done on its own and with the contribution of projects such as Move It Like Lublin.

The merger is facilitated by several factors:

- ✓ RTEC and PUA belong to the same group of enterprises, with a founder and sole owner;
- ✓ The companies operate in the field of urban passenger transport, with a high economic and market potential (practically a monopoly, but allowed, under certain conditions, by European regulations);
- ✓ Given that businesses have the same object of activity, they use (or could use) to a large extent the same human and financial resources, public infrastructure, buildings, constructions and own facilities.

In addition to the reasons set out above, the merger is based on other economic and travel reasons, namely:

- ✓ The merger will allow the implementation of unique human resources policies as a result of the introduction of the same standards and level of protection for employees, as well as the expansion of professional opportunities within the merged company;
- ✓ Savings of human and financial resources by eliminating the record of reciprocal and identical transactions (suppliers and financiers), simplification of financial reporting procedures and to the management of the enterprise, but also to the founder;
- ✓ Facilitate the access of the merged company to sources of financing in order to develop its activity.
- ✓ Strengthening the financial power of the merged enterprise;
- ✓ The merger will allow the application of a common marketing and PR policy and will increase the bargaining power with contractual partners - suppliers and customers;
- ✓ Maintaining a single customer interface, through sales of tickets and single season tickets, the introduction of innovative methods of payment and tracking of transport units (customer phone application), which would help lead to more frequent use of public versus private transport.

II.4.2. Financial aspects of the merger process

The reorganization procedure, including merger by absorption in the Republic of Moldova is regulated by several normative acts, such as: Civil Code (art. 69-85, 135, 144, 178); Law on Entrepreneurship and Enterprises no. 845/1992 (arts. 32, 33); Law on limited liability companies no. 135/2007 (art. 80, 81); Law on state registration of legal entities and individual entrepreneurs no. 220/2007 (art. 20-22). The provisions of SNC 22- Business combinations apply in the accounting records of the merger operations.

Merger is the operation by which two or more for-profit legal entities decide to merge their assets into a single legal entity in order to carry out the joint business activity.

The merger could give rise to key economic concentrations - and this is exactly the case with RTEC and PUA. Their merger, plus the adoption by the CMC of the Quality Standards for municipal public transport from September 1, 2022, will create an economic situation of concentration of the public transport activity, without it being able to be called a *monopoly* , for the following two reasons:

- a. The two current public operators do not operate in a competitive regime, having the same subordination, the same owner and the same source of operational and investment financing. Their institutional separation was achieved in 1998 with a false economic motivation and without any connection with the creation of a competitive market;
- b. Quality standards for municipal public transport do not prohibit or artificially hinder the access of other operators, but impose absolutely normal conditions in the field for used vehicles.

However, the merger will have to be reported to the Competition Council of the Republic of Moldova through a procedure for notification of an economic concentration,

to which a written response will be requested and received within the time limit established by law. In the argumentation of the report it should be emphasized, apart from the reasons set out above, that the urban transport service is a de facto social service, essential for the sustainable development of the community and having as beneficiaries all categories of citizens, including those to be supported by tariffs: less wealthy, pupils, students, pensioners and people with special needs. Therefore, the principles of economic liberalism are strongly amended in this area for social reasons.

Absorption is the most common form of business merger and consists of the incorporation by one legal entity (absorbing) of another legal entity (absorbed) which, as a result, is liquidated. Absorption results in the transfer of the rights and obligations of the absorbed undertaking to the absorbing undertaking. The absorbing legal entity continues to exist after the merger (under the same or a new name), but sums up the rights and obligations of the absorbed company, which is as a result deleted from the State Register.

The merger of the legal entity leads to the liquidation of one and this can affect both the interests of the founders and of the creditors with whom the liquidated legal entity has established contractual relations. Therefore, creditors must be notified in writing of the reorganization and have the right to request the early termination or execution of the obligations of the legal entity subject to reorganization, as well as the restitution of damages incurred on this occasion.

The assets and liabilities of the merging companies are highlighted in their financial statements, referred to in full as “Merger Financial Statements”, concluded at a reference date, to be determined by the management of the companies and the founder, complying with the legal terms and procedures in force. .

The Merger Financial Statements are presented by both companies at the set reference date. In addition, the consolidated balance sheet of the merged company is compiled in the form of a post-merger balance sheet. The creation of the consolidated balance sheet, but also the merger of the Assets and Liabilities items requires in-depth knowledge of the National Accounting Standards, which the chief accountants of enterprises as a rule do not possess, therefore this accounting exercise is recommended to be subcontracted from a local audit company. experienced in such operations.

The selected audit firm will be required to perform the following tasks:

- determine the book value of the merging shares of the merging companies, using the method of the net accounting assets of each enterprise, on the date set and determine the exchange ratio of the shares or quotas;
- to supervise the process of checking the balances of the absorbed company, in order to transfer all its debts to the absorbing company;
- to supervise the inventory of tangible and intangible assets, of the debtor and creditor debts of both enterprises in order to be transferred from the absorbed to the absorbing company;
- to supervise the documentation of the transfer of the assets and their correct accounting to the absorbing company;

- to renew the accounting policies of the absorbing company (if necessary);
- to support the financial department of the new company in redistributing common tasks and optimizing internal processes (optional);
- to propose the model of the merger contract;
- other tasks at the discretion of the founder.

The absorbing company will receive from the absorbed one the assets, including the commercial receivables, but also the capital, the accumulated profit (actually losses), the created reserves, the debts towards all creditors, the employees, which it will have to re-employ in similar functions. and in conditions no worse than in the absorbed company, or to grant them the guarantees provided by the Labor Code of the Republic of Moldova in case of dismissal of staff at the reorganization of the enterprise.

II.5. The stages of the merging process

Merging companies must inventory and measure their assets, liabilities and equity, with the aim of presenting a true, clear and complete picture of the financial situation and performance of companies in the merger reorganization. This exercise allows the determination of the patrimony brought by each company and the exchange rate of the shares or social parts of the companies, of the number of shares that will be issued by the absorbing company to reflect the value of the capital of the absorbed company.

In order to determine the exchange ratio of shares or shares, the carrying amount of the shares must be determined. The carrying amount of a share can be obtained by relating the net accounting asset to the number of shares. Also, the exchange ratio will be established, by reporting the carrying amount of a share to be absorbed to the carrying amount of a share or share of the acquiring company.

The total valuation of each company participating in the merger is made during the inventory of assets (assets and liabilities) before drawing up the balance sheet. In the case of fixed assets, their valuation is performed at the reference date by a valuation company, and the results of this valuation serve as a basis for the revaluation of the balance sheet value of fixed assets in both companies. The recognition of the inventory value of assets and liabilities will be done by preparing the balance sheet before the merger - this exercise would be facilitated by choosing the reference date to coincide with the date of the annual balance sheet, for example 01.01.2022 for which we have collected reference, even if they are not final and audited.

Thus, assuming 1 January 2022 as the reference date for the purpose of this project, the merger accounting year would produce a balance sheet as follows:

MERGER ACCOUNTING BALANCE SHEET (project)
on January 1, 2022

| ACTIVE | RTEC without revaluation | RTEC with revaluation | PUA without revaluation | PUA with revaluation | RTEC after the merger |
|----------------------|--------------------------|-----------------------|-------------------------|----------------------|-----------------------|
| Total Fixed Assets | 698,849,374 | 698,849,374 | 439,832,222 | 439,832,222 | 1,138,681,596 |
| Total Current Assets | 133,530,901 | 133,530,901 | 38,145,092 | 38,145,092 | 171,675,993 |

| | | | | | |
|--------------------------|---------------------------------|------------------------------|--------------------------------|-----------------------------|------------------------------|
| TOTAL Active | 832,380,275 | 832,380,275 | 477,977,314 | 477,977,314 | 1,310,357,589 |
| PASSIVE | RTEC without revaluation | RTEC with revaluation | PUA without revaluation | PUA with revaluation | RTEC after the merger |
| Own capital | 720,047,141 | 720,047,141 | 398,530,069 | 398,530,069 | 1,118,577,210 |
| Long-term debt | 65,800,000 | 65,800,000 | 37,121,721 | 37,121,721 | 102,921,721 |
| Current debts | 46,533,134 | 46,533,134 | 42,325,523 | 42,325,523 | 88,858,657 |
| TOTAL Liabilities | 832,380,275 | 832,380,275 | 477,977,313 | 477,977,313 | 1,310,357,588 |

The variant of the revalued balance sheet will most likely be different from the one without revaluation, due to the value (probably different) of the fixed assets valued by a valuation company at the date of the merger. Thus, the values of the assets and equity of both companies after the revaluation will be different, which will influence the value of the assets and equity of RTEC after the merger. In the case of recently purchased means of transport, the market value is very close to the balance sheet value. As practically the entire PUA bus fleet is purchased in 2021, including those with turnover, their value must be very close to or equal to that recorded in the balance sheet. In real estate, the situation is different and most likely the market value is higher than the balance sheet. For the purpose of this report, we assume the value of revalued fixed assets as identical to the remaining values of the balance sheet fixed assets.

The profit and loss ratio after the merger will be formed based on the result recorded in the profit and loss account by the acquiring company and the absorbed company in the same reference period, in the case of January 1 - December 31, 2021. The effect of reciprocal operations is excluded. took place. A merged profit and loss ratio (without reciprocal transactions) will look like this:

REPORT ON FINANCIAL RESULTS (merger, project)

from January 1, 2021

until December 31, 2021

| Indicator | Management period 2021 | | | |
|--|------------------------|-------------|-------------|-----------------------|
| | A | RTEC | PUA | RTEC after the merger |
| Net sales (611) | | 519,050,128 | 191,281,612 | 710,331,740 |
| Cost of sales (711) | | 486,595,192 | 182,417,757 | 669,012,949 |
| Gross profit (global loss) (rd. 010 - rd.020) | | 32,454,936 | 8,863,855 | 41,318,791 |
| Other operating income (612) | | 9,192,723 | 1,986,746 | 11,179,469 |
| Business expenses (712) | | 519,467 | 8,443,458 | 8,962,925 |
| General and administrative expenses (713) | | 20,017,620 | 11,572,621 | 31,590,241 |
| Other Operating Expenditure (714) | | 7,936,666 | 1,639,933 | 9,576,599 |
| Result from operational activity: profit (loss) | | 13,173,906 | -10,805,411 | 2,368,495 |
| Result from investment activity: profit (loss) (621-721) | | 0 | 797,397 | 797,397 |
| Result from financial activity: profit (loss) (622-722) | | 7,761,016 | 1,065,823 | 8,826,839 |
| Result from economic and financial activity: profit (loss) | | 20,934,922 | -8,942,191 | 11,992,731 |
| Exceptional result: profit (loss) (623-723) | | | | 0 |
| Profit (loss) of the management period until taxation | | 20,934,922 | -8,942,191 | 11,992,731 |
| Income tax expense (savings) (731) | | | | 0 |
| Net profit (net loss) | | 20,934,922 | -8,942,191 | 11,992,731 |

The PUA accounting will prepare a deed of receipt-delivery of fixed assets, which will indicate the remaining balance sheet value of all fixed assets, plus the value obtained from the evaluation of each asset, the number of internal inventory and the date of

commissioning. The registration of fixed assets taken over from the RTEC balance sheet will be made on the basis of the discounted market value.

The draft deed of receipt of the fixed assets will show as follows:

RECEIPT-DELIVERY OF FIXED MEANS (PROJECT)

From: PUA cod IDNO
 To: RTEC IDNO code
 DATE: 01.01.22

| Fixed Means | | | On 31.12.2021 | On 31.12.2021 |
|-------------|---|------------------------|-----------------|---|
| Not M. Inv. | The name | Date of commissioning. | Remaining value | Market value according to the revaluation |
| | 123.1 | | | |
| | ADMINISTRATIVE BLOCK _ 918.3 m2 | | 2,961,698.19 | |
| | BLOCK NO. 1 _ 2592.0m2 (ROOF REPAIR) _August 2021 | | 549,899.22 | |
| | BLOCK NO. 1 _ 2592.0m2 (Repair of the block for assembling the buses) | | 895,386.55 | |
| | BLOCK NO 1 _ 2592.0m2 (Repair financed by DGTCC) | | 2,608,351.94 | |
| | BLOCK NR 1 _ 2592.0m2 (laundry, diagnostic warehouse) | | 2,526,158.51 | |
| | MAIN PRODUCTION BLOCK _ 9697.2m2 | | 10,847,420.00 | |
| | HOUSE (3X2rooms) | | 13,460.00 | |
| | HOUSE (3X2rooms) | | 3,970.00 | |
| | HOUSES B/O EXPRESS 18 PIECES | | 55,063.00 | |
| | DISPATCH KIOSK (IZMAIL) | | 63,600.00 | |
| | HOSPITALITY BLOCK CLUB _ 890.3m2 | | 1,899,855.00 | |
| | PASSAGE GALLERY NO. 1 | | 393,596.00 | |
| | PASSAGE GALLERY NR2 | | 106,875.00 | |
| | Board games (V.Voda) | | 37,618.00 | |
| | CONTROL POINT _ 464.8m2 _ (4-positions) | | 334,136.00 | |
| | Repair ADMINISTRATIVE BLOCK _ 918.3 m2 (WARDROBE) | | 715,060.59 | |
| | FUEL STATION _ 34.3 m2 (PECO) | | 412,904.00 | |
| | RENOVATED FOOD STATION (FOOD COLUMN. 1, 2) Funded by DGTCC | | 676,800.00 | |
| | 123.2 | | | |
| | ACCESS BAR at Grenoble Dispatcher (V Category) | | 7,177.10 | |
| | ACCESS BAR at Izmail Dispatch Office | | 15,523.20 | |
| | SETTLING TANK | | 555,917.00 | |
| | SETTLING TANK | | 112,292.00 | |
| | CAR BOX _ 108.1m2 | | 60,480.00 | |
| | UNDERGROUND LIGHTING CABLE | | 49,572.00 | |
| | OIL AND PETROL SENSOR | | 5,000.00 | |
| | OIL AND PETROL SENSOR | | 5,000.00 | |
| | OIL AND PETROL SENSOR | | 5,000.00 | |
| | OIL AND PETROL SENSOR | | 5,000.00 | |
| | KIOSK P / U DISPECERATED (GRENOBLEA) | | 21,501.74 | |
| | DISPATCH KIOSK (TOPAZ) | | 42,652.03 | |
| | WATER CONDUCT | | 3,264.00 | |
| | AUTO LADDER | | 9,060.00 | |
| | BOOTH for sport field | | 45,090.31 | |
| | ASPHALT CLOTHING (funded by DGTCC) | | 507,836.98 | |
| | --- | | | |
| | --- | | | |
| | --- | | | |
| | 123.8 | | | |
| | MERCEDES-BENZ O530 CITARO 4252 P-0455 | | 9,939.03 | |
| | MERCEDES-BENZ O530 CITARO 4462 P-0456 | | 10,342.53 | |

| | | | | |
|--|--|--|-----------------------|-------------|
| | 123.9 | | | |
| | FURNITURE SET (3 tables with drawers, small cupboard with drawers) | | 11,789.00 | |
| | TOTAL: | | 477,074,537.59 | 0.00 |

To be transmitted by 'Urban Bus Park':
Chairman of the committee:, Director

Member of the committee:, Chief Accountant

Member of the Commission:, Chief Engineer

Received by the commission of 'Regia Transport Electric Chişinău':
Chairman of the committee:, Director

Member of the committee:, Chief Accountant

Member of the Commission:, Chief Engineer

Based on this act, the accounting service of the absorbing company will record the fixed assets, assigning them new inventory numbers and operating terms. Similarly, the balances of other existing asset and liability accounts with the absorbed company will be taken over. Also, the legal documents attesting the ownership right over the transferred goods and values will be handed over, the primary documents on the basis of which the entries in the accounting records of the absorbed enterprise were made (archive). The fixed assets will then be allocated to the managers re-employed in the absorbing company, with the signing of the material liability contracts. The processes of collection and accounting of the primary documents resulting from the economic activity of the PUA will also be adjusted, based on the organizational chart of the accounting service of the merged enterprise.

The totality of the inventory processes, re-evaluation of the fixed assets, elaboration of the pre- and post-merger balance sheets, of the receipt-delivery documents lasts in practice 6-10 weeks, depending on the human resources available at the company absorbed for these processes, but also by the experience of the audit firm employed. These terms must be taken into account at the planning stage of the merger process, as the draft merged balance sheet, together with the act of receipt-delivery of fixed assets will be submitted as part of the notification to the Competition Council.

Finally, the internal processes in the Accounting, Forecasting and Analysis services will be adjusted for the new volumes of operations, ie plus a transport fleet and a new type of vehicle, with a distinct operating cost. Both companies have qualified staff to support the merger and adjustment of internal processes, ensuring a correct and efficient record of the economic activities and assets of a merged enterprise.

CHAPTER III

HUMAN RESOURCES ASSESSMENT FOLLOWING THE MERGER

III.1. General considerations

It is important to mention that, during the years 1994-1997, in the Municipality of Chisinau²⁰ there was only one municipal enterprise that managed both trolleybuses and buses : "Directed urban passenger transport (RTUP)". The main argument that led to the separation of this company was that the trolleybuses brought income and this income was redirected to the repair of buses.

Thus, although it was a single enterprise, it was not possible to implement an integrated vision on transport. The objectives of transport development have been addressed individually and separately without taking into account the synergy achieved as a result of efficient coordination, integration and interoperable actions.

Moreover , it is interesting that the myth that trolleybus transport is profitable, while bus transport only contributes to losses, still exists today . In fact, the financial data of the companies show that without the subsidies from the municipal budget, both RTEC and PUA would not have been able to operate.

In this report we analyze in the complex public transport and local infrastructure through a potential merger between Regia Transport Electric Chisinau and the Urban Bus Park . The benefits of this merger (*in the case of a pro CMC decision*) will be presented , as well as potential risks, impediments and/or social losses.

We will also highlight the potential financial and operational benefits by creating a new structure, which will be able to be called the **Municipal Public Transport Enterprise Chisinau** (IMTPC), or the **Chisinau Public Transport Company** (STPC).

A consolidated municipal enterprise would allow both a coherent and efficient operation and a rational and strategic assessment of the needs and priorities of public transport , reducing the pressure on the local budget to sustainable values, as a result of the synergy obtained.

The main benefits of the integrated approach in public transport are the following :

- ✓ Reducing the pressure on the local budget to long-term sustainable values, by applying a new tariff offer and optimizing the transport network;
- ✓ An improved and optimized model of governance and leadership;
- ✓ A structure that allows for effective strategic decision-making for the budget;
- ✓ A unique “*Customer Service*” center, which would be more convenient and transparent for the population;

²⁰ Chisinau public transport project: Consultancy program on public transport regulation and restructuring.

- ✓ Increasing the sustainability of public transport and the image of the new company;
- ✓ Increasing the quality and traceability of public transport by offering integrated transport tickets at attractive rates ensuring an optimal travel time by synchronizing schedules and routes;
- ✓ Increasing the collection and accumulation of financial resources, by leasing one or more available buildings;
- ✓ Balancing / optimizing the municipal budget by ensuring the efficiency of spending public money related to public transport;
- ✓ A new structure, which will manage to ensure the operational budget with a reasonable profit (usually 5% -7%).

The merger of RTEC and PUA would make it possible to achieve the following long-term goals ²¹:

Administrative integration: reducing the functions of more than a thousand tax collectors, partly leading management positions, excluding duplicate functions and improving staff management could help increase productivity and reduce wage costs. It will be necessary to reduce certain management functions - on average by 20%, as well as the full reduction of taxpayers (drivers), with 274 people at PUA and 688 people at RTEC, reviewers 30-36 at RTEC and 5 to PUA, and subsequently the transfer of around 25% of the reduced staff to new **positions** within the **Municipal Public Transport Enterprise Chisinau** (MPTEC) in the direction of customer service. This would mean re-employing 240 people, who worked as tax collectors or auditors.

So, in total, around 963 functions would be reduced at the operational level and 40 at the administrative level. In figures, this would mean a saving of about 120 million lei per year, only from salary.

Currently, these 66 municipal enterprises employ around 661 drivers at RTEC and 285 at PUA according to the employment list. Following the joint meeting of May 26, 2022, it was agreed that these functions will be retained, because even at the moment, the number of offers is limited.

Operational integration: by creating a single traffic dispatcher, which would run both trolleybuses and buses and contribute to improving public transport activity. The single center will allow a better synchronization of public transport frequencies, so that vehicles run in a "constant interval" system and not according to the individual schedule. The implementation of new information technologies would reduce the time required to respond to traffic challenges.

Electronic taxation: The implementation of the electronic taxation system will reduce costs by at least 70% (compared to the existing system of taxpayers). It is true that investment in equipment and applications is needed , but this is usually amortized . in

²¹ <https://www.chisinau.md/pageview.php?l=ro&idc=728&id=9603&t=/Utile/Transport/Strategia-de-Transport-a-Municipiului-Chiinau/Strategia-de-Transport-a-Municipiului-Chisinau/>

3-5 years (according to their international practice). This change will also make it possible to obtain truthful information on the flow of passengers, which will make it possible to establish a more transparent formula for the cost of a public transport journey. Digitization of services, including advanced data analysis is the key tool for streamlining transport processes.

Integration of vehicle maintenance will have little impact given the technical differences between the transport units and the specific capabilities of the drivers. But in an integrated management, an improvement in labor productivity could be achieved.

Information and planning integration represents a high potential for savings as a result of re-evaluating routes / frequencies and adjusting them to the existing demand in the system. Supports the development of a transport system focused on the needs of citizens in route planning, the quality of service provided and the level of information.

Investments in road infrastructure alone, such as widening roads and improving the road surface, cannot completely solve the traffic problem. Traffic management measures will have a low impact, given that the vast majority of roads will be blocked with traffic jams. The most effective way to improve the situation is to implement policies that would lead to the gradual reduction of private transport units. Encouraging the shift from private to public transport is a step in the right direction. But in order to achieve significant results, it is important to optimize existing public transport through an integrated approach that would improve public transport services by increasing its attractiveness.

The merger of the Chisinau Electric Transport Authority with the Urban Trolleybus Park by creating a single operator, with a single administration, with integrated electronic charging, with transparent financial planning and the full involvement of citizens and civil society in the process of route management/planning is a first step. for the development of transport in Chisinau.

III.2. Functionality of the organizational structure

III.2.1. Directed by Electric Transport Chisinau

According to the RTEC organizational chart, three employees report to the general manager - the technical director (technical service, repair, electrical networks and car service), the chief accountant (financial-economic service, IT, procurement, security and legal) and the deputy director (responsible for traffic, overhaul and control services and ancillary services, (Annex 5, RTEC Organization Chart) .

The administration team manages and monitors the trolleybus fleet no. 1, no. 2 and no. 3 and ARM (assembly of the electrical networks service).

This organization chart is a pyramidal, vertical one and does not allow flexibility or operational interactions between sections, departments. The advantage of this type of organization chart is maintaining order in the team and reducing wrong decisions. In general, this organization chart seems to be functional.

The structure of the RTEC entity includes: the administrative apparatus that ensures the institutional management and the circulation of the electric transport, 3 trolleybus parks, a public food center, a medical center and a center for holidays (rehabilitation).

The company has 433 in total, of which 12 in repairs and 330 daily on the line, and the rest in reserve. Their average age is 11.5 years, and this number of 433 trolleybuses in stock is a “flexible” one, because it is planned to be purchased in 69 in 2022 and around 20 trolleybuses to be reassembled.

III.2.2. Urban Bus Park

Within the PUA, the Board of Directors (BOD) is at the top of the management, to which the General Manager reports. It in turn has 11 departments that it directly manages: chief accountant, deputy director of operations, deputy technical director, economic analysis service, control and revision service, personal service, lawyer, project manager, road safety engineer, Express rest base and the canteen (Annex 6, PUA Organization Chart). At this enterprise the organizational chart is less pyramidal, being more horizontal. This would also mean a greater concentration of tasks and decisions on a single person, ie the task of the Director-General.

The PUA structure includes: the administrative apparatus that ensures the institutional management and the circulation of the buses; a bus park; a public catering complex , a leisure center and a car park. The company has 205 transport units, the average age of which is 5.1 years.

Table no. 17: RTEC and PUA staff

| | Director Electric Transport Chisinau | Urban Bus Park |
|--|---|-----------------------|
| Number of units of Transport | 330 to the line <i>(in stock 433 total, of which 12 in long-term repair)</i> | 205 |
| Number of drivers | 669 | 285 |
| Number of conductors | 688 | 274 |
| Number of specialists and officials | 340 | 118 |
| Number of workers | 750 | 158 |

| | | |
|------------------------|-------------|---|
| | | <i>(of which 79 basic in production)</i> |
| TOTAL employees | 2447 | 835 |

The current structure of Regia Transport Electric and the Urban Bus Park is outdated . Analyzing the incomes and expenses of these municipal enterprises, we find that the income from passenger transport does not cover the personnel expenses either. Given that the income of companies does not cover the salary needs of companies, then it is difficult to attract major investments to improve public transport. That is why it is very important to analyze the number of employees and to identify their optimal number. Even if there are technical differences between trolleybuses and buses, the possibility of achieving a more efficient business activity by centralizing the public procurement process, unifying the economic analysis, personnel or accounting service must be examined if we find a doubling of the functions of management and administration of public transport in Chisinau.

A version of the organization chart after a possible merger is presented in Annex 8.

The ratio between employees and the number of transport units is presented below.

Table no . 18: Personal-unit transport ratio

| | RTEC | PUA |
|-------------------------------|-------------|-------------|
| Drivers per transport unit | 1,96 | 1,4 |
| Conductors per transport unit | 2,02 | 1,34 |
| Workers per transport unit | 2,20 | 0,77 |
| Total employees | 2447 | 835 |
| Employees per transport unit | 7,18 | 4,07 |

At RTEC there are 7,18 employees for each trolleybus, while at PUA the ratio is 4,07 for each bus. For comparison, one U.S. public transportation company registers only 3 maximum 3,5 employees for each transport unit. This is possible due to the efficiencies obtained as a result of the implementation of electronic tickets and the outsourcing of cleaning services and partly those of maintenance/repair of transport units.

III.3. Centralization of institutional management functions (To Be scenario)

Following several discussions with representatives of both companies (RTEC and PUA), managed to complete the two questionnaires related to the contexts of the organization in terms of structure, management, quality and functionality (Annex them 6 and 7). The current situation regarding the scope of the quality management system was determined. Some procedures, regulations (quite vague) exist, as well as job descriptions , but it will certainly be necessary to implement the ISO 9001:2015 quality management standards, regardless of whether the merger will take place or not .

Table no.19: Analysis of structure changes, after merging by directions, subdivisions, functions (To Be)

| Change | Achievement | Reasoning |
|--|--|---|
| Passing the functions of <u>auditors</u> (who check the tax collectors) <u>in controllers</u> (checking passenger tickets) | Migration of specialists <i>from auditors to controllers</i> . Adjusting new job descriptions, signing new contracts | In the case of electronic tickets, there will be no tax collectors. So the need for reviewers disappears. |
| Some tax collectors, estimated 20 % (who have skills) will be passed the same as <u>AUDITORS</u> | Migration of specialists <i>from tax collectors to controllers</i> . Adjusting new job descriptions, training and signing new contracts. | In the case of electronic tickets, there will be no tax collectors. So much of it will be reduced, and some with more skills and experience will become controllers. |
| Some tax collectors, estimated 25 % (who have skills) they could also be moved in the newly created <u>Customer Service direction</u> | Migration of <i>tax specialists to Customer Service</i> . Adjusting new job descriptions, training and signing new contracts. | In the case of electronic tickets, there will be no tax collectors. So a lot of them will be trained and transferred to other business positions. |
| A small part of the drivers could be reduced , only those who serve the administration (<i>or even partially and those who do not reach the performance indicators or who have reached retirement age</i>) | Analysis of drivers' performance and termination of certain contracts, especially with those who do not meet the rules. | In case of optimization of several routes on the duplicating routes , or shortening of certain routes, it will partially lead to the optimization the number of drivers. |
| The administrative management provides for a reduction or transfer in other directions with at least 10% of the functions (<i>accounting, legal department, procurement, human resources, a director and deputy directors</i>) | Likewise, following the performance analysis, decisions will be made. Compensation for reduced positions, according to the labor code, the accounting law and the fiscal code. | In case of merger and reduction of at least one thousand positions, of course there will be no need for the same number of specialists in human resources, accounting, legal department, supply, economics and forecasts, fuel service , dispatching, etc. Many of these functions are doubles. |
| Reduction of the | A working group | With the renewal of the fleet of |

| | | |
|--|--|---|
| <p>functions of mechanics and park workers (<i>especially from the PUA</i>), who provide the repair and maintenance service. A 25 % discount is estimated , because the bus fleet has been renewed along the way</p> | <p>(technical experts) will be organized to analyze the performance of workers. Compensation for reduced positions, according to the labor code, the accounting law and the fiscal code.</p> | <p>buses (especially electric buses) and trolleybuses with new vehicles, the need for repairs decreases, which statistically speaking represents about 1 worker per vehicle (compared to developed countries where one worker per 5 vehicles operates).²²</p> |
|--|--|---|

The merger of RTEC and PUA will allow the optimization of staff, taking into account the needs of the company and the possibilities of the municipal budget. At the level of institutional management, premises will be created for reducing the central apparatus by 30-40 management positions within the departments that perform similar functions: accounting, personal service, legal service, labor protection service, economic analysis and forecasting service, information technology service and dispatching services. Centralizing them would improve institutional management and reduce payroll costs.

The merger of these departments is also necessary because there is currently no close collaboration between municipal enterprises. Each company has its own economic analysis and forecasting service and this does not allow for synergy. The overcrowding of transport units during peak hours and the small number of passengers during the day are one of the consequences of the lack of coordination and cooperation.

Efficiencies in administrative integration can also be achieved by improving internal processes. Offering the salary on the card would reduce the number of people employed at the cashier, would reduce the need for employees to stand in line to sign and raise the salary in cash, would also reduce the risk of fraud. The lack of a well-developed control system and the abundance of cash transactions (for example , the payment of wages or the sale of tickets and season tickets) are a conducive environment for perpetuating fraud.

III.4. Data collection and reporting

According to the contracts for the provision of public transport service between Chisinau and municipal enterprises, they are required to submit a monthly report based on which the municipality transfers money to compensate for the services provided. The monthly reports are not placed either on the pages of the enterprises or on the page of the Chisinau City Hall.

Digitization of services, including advanced data analysis is the key tool for streamlining transport processes. The lack of such an analysis has also contributed to the current state of public transport in Chisinau.

²²Maintenance Technician Staffing Levels for Modern Public Transit Fleets
<https://www.trb.org/TCRP/Blurbs/173927.aspx>

A uniform system of data collection and reporting to local authorities is one of the basic ingredients for ensuring service planning, making the right management decisions and transparently setting the travel price. The merger of RTEC and PUA will reduce the reports collected by half, thus reducing the administrative burden. An absolutely mandatory condition must be to ensure the transparency of these data, especially given that grants are awarded on the basis of the data included in these reports.

III.5. Reducing the number of workers in parks

According to the heads of the transport units and drivers (tax collectors), the most numerous category of employees is represented by the park mechanics and workers, who provide the repair and maintenance service, as well as the cleaning/washing services of the transport units. To determine the optimal level of labor required, we compared data provided by municipal enterprises with data obtained from similar transportation companies in the United States. The benchmarking process allows a reasoned analysis of the local characteristics with those existing in similar conditions in other localities. The data in Table 20 would suggest that the number of workers is too high. If there are 4 other similar undertakings - 5 transport units for each employee employed, in municipal enterprises there are 3-4 reverse employees for each transport unit, although the number of km traveled and the total number of operating hours is comparable to the results of other public transport companies. At the same time, there are significant differences between the results obtained by RTEC and PUA.

Although the average age of transport units at RTEC is significantly lower than at PUA, the number of workers in the parks is still double. And with the renewal of the trolleybus fleet, there was no decrease in the number of repair or maintenance staff. Thus, there would be preconditions for savings as a result of increasing the efficiency of the work of workers in these enterprises, especially if the modernization program of transport units will continue and a reduction of workers of up to 50% will be implemented .

Table no. 20: ²³ Number of workers in parks and services at RTEC, PUA and similar companies in the USA.

| | Benchmarking USA (250-299 transport units) | Regia Transport Electric (341 units) | Urban Bus Park (205 units) |
|----------------------------|---|---|---|
| Transport units per worker | 4.9 | 0.45 | 0.77 |
| KM traveled per worker | 281.860 | 29.185 | 67.262 |
| Operating hours per worker | 12.264 | 1.716 | 3.956 |

²³Maintenance Technician Staffing Levels for Modern Public Transit Fleets - <https://www.trb.org/TCRP/Blurbs/173927.aspx>

| | | | |
|--|---------|------------|-----------|
| KM traveled annually by a transport unit | 72.193 | 55.807 | 64.000 |
| Operating hours per transport unit | 2.976 | 3.282 | 3.765 |
| Average age of transport units | 7 years | 11.5 years | 5.1 years |

Table no. 21: Summary of the administrative integration assessment

| Evaluation criterion | The impact | Comments |
|---|-------------------|--|
| Operating cost | Positive | The costs of hiring staff, maintenance or public procurement will be made by a single organization, thus increasing savings, including in terms of reducing administrative staff. Reducing the number of employees following the merger would save about 120 million a year for the company (municipal budget), only from pay . |
| The efficiency of the transport system | Positive | Standardization of operating procedures and reduction of differences between the service provided by RTEC and PUA. |
| Quality of service provided | Positive | Standardization of operating procedures and reduction of differences between the service provided by RTEC and PUA. |
| Benefit for citizens/users | Neutral | Citizens are less interested in whether there is one or more businesses. What matters more is the level of integration and cooperation between different modes of transport. |
| The system of governance | Positive | The merger of the companies will place a special emphasis on ensuring the transparency of the activity, especially in the conditions in which the company will continue to be subsidized by the municipal budget. |

The efficient organization of transport services is the basic function of municipal enterprises.

The main functions in this sector are: setting the timetable, managing staff (most importantly drivers and drivers), directing transport units during the day, ensuring transport safety and security, monitoring and collecting data and providing customer service. At present, all these functions are performed individually by RTEC and PUA in the absence of collaboration or cooperation. This causes duplication of activities that contribute to inefficiency in the organization of public transport.

The RTEC traffic service employs 48 line operators and 14 line dispatchers. Line operators record the time of departure and arrival of the transport unit at the terminus station. According to the information obtained, line operators do not have the right to increase or decrease the traffic interval of the transport units which is set in time and

handed to the driver in the morning when he leaves the route by the line dispatcher. Moreover, the reports or statistical data collected by this subdivision are not made public in order to provide information to users on the degree of compliance with the public transport timetable. Thus, the added value for users of this service is quite low. There are currently twenty dispatchers operating at PUA and their functions are similar to those of RTEC:

Individual planning and monitoring of routes and frequencies contributes to passenger inconvenience. For the development of an efficient public transport in Chisinau, an essential condition is the creation of an integrated dispatching office that will regulate the development of the entire transport process. The implementation of the electronic charging system and the GPS monitoring system of the transport units will allow the establishment of an optimal interval depending on the flow of passengers.

CHAPTER IV

OTHER BENEFITS OF THE MERGER

IV.1. Unique center for public transport management

The creation of a single control center that will monitor the flows of passengers and transport units using the GPS system will be a significant improvement on the situation we currently have. Each type of transport has its own schedule that does not take into account the needs of the entire system. The individual collection of information and still on paper does not allow the right decisions to be made in real time. A single dispatcher would substantially reduce the reaction time in different situations such as an accident or increase the flow of passengers in a given region and would contribute to the efficient management of the total transport capacity.

IV.2. Improved customer service

The concerns and problems of public transport users in Chisinau will be better addressed in the context of the entire transit network. The existence of two separate companies, RTEC and PUA, did not allow the creation of a very clear communication channel through which citizens could influence local decisions in this area. A vital element in the unification of transport services will be constant communication with citizens, by organizing public meetings in order to obtain feedback, measuring the level of satisfaction and setting priorities for the development of transport infrastructure. The new single administration model must give citizens a stronger voice in the field of public transport management.

Table no. 22: Summary of the evaluation of operational integration

| Evaluation criterion | The impact | Comments |
|---|-------------------|---|
| Operating cost | Positive | With the implementation of the GPS system and the unification of dispatchers, the staff of these units could be reduced by at least 2/3 . |
| The efficiency of the transport system | Positive | The single dispatcher will allow the integrated management of the transport system. It is able to respond to more challenges: in the event of an accident or the need to increase the number of transport units on a given route. |
| Quality of service provided | Positive | Public transport will become more flexible and citizens will have access to improved customer service. |
| Benefit for citizens/users | Positive | Standardization of operating procedures and reduction of differences between the service provided by RTEC and PUA. |
| The system of governance | Positive | Creating the single dispatcher by merger is easier said than done by establishing a collaboration agreement for two different entities. |

IV.3. Integration of public communication

Public transport in Chisinau deals with public communication at all or extremely little, limiting itself to taking e travel from one station to another, without anyone being interested in how they travel on the other segments of the journey to reach the final destination. If a mode change is required (bus/trolleybus or vice versa) things get even more complicated. The lack of a simple and comprehensive map of public transport, as

well as poor information through web pages is a major problem that leads to a decrease in perceived quality and number of passengers.

Given that the two operators show little interest in this issue, a single operator resulting from the merger will have the chance to start on other bases, with the provision of correct, complete and up-to-date information.

IV.4. Unique brand for merged public transport

Public transport in Chisinau is perceived as very inconvenient and inefficient. If local authorities want to attract as many users as possible, then the system must be as simple as possible. The consolidation of operations will allow the evaluation of existing routes and their full review. The integration of services could also mean expanding transport to areas that were not previously covered. Its simplest structure and a very clear identity is a precondition for increasing the number of passengers in public transport. Without a single identifiable public transport brand, the impression would be created that the municipal enterprises RTEC and PUA are in a continuous competition. Both RTEC and PUA need to develop marketing plans to increase the number of passengers using municipal public transport. The existence of a single brand would allow the development of a single marketing plan that would convince citizens to choose public transport over private one and not a marketing plan that would convince them that the trolleybus is better than the bus. This is characteristic of many European cities: London - Transport for London; Bucharest - Societatea de Transport București SA (until recently Regia Autonomă Transport București); Cluj - Public Transport Company; Tallinn - Transport City Tallinn.

IV.5. Consolidated budget

In accordance with the contracts on the provision of public transport services between Chisinau on the one hand and RTEC and PUA on the other, the calculation formula for obtaining financing from the local budget is the same. Therefore, a possible merger would also simplify the process of approving the company's budget and improve the transparency of this exercise. The new budget will include the estimated costs and revenues for the entire transport system and there will be no need to approve two different documents or make multiple transfers. This will also reduce the administrative burden for local authority officials.

IV.6. Route network

As mentioned earlier, each company now has its own analysis and forecasting service. This does not allow the overall assessment of transport demand. Chisinau needs an enterprise that can research, analyze and forecast not through a departmental prism, but

a holistic and exhaustive one. This must make it possible to anticipate population growth in a given region, to identify areas where a concentration of jobs is observed or to establish exactly the flows of travelers between sectors of the municipality. A streamlined scheme of public transport routes would exclude the factor of parallelism and duplication of routes, especially in the central area of the municipality of Chisinau.

IV.7. Public hearings²⁴

The major objective of this public policy-making exercise is to create an efficient platform in Chisinau, in order to allow citizens and civil society organizations to participate in the local decision-making process and increase civic engagement.

On March 22, 2018, public hearings on this project were organized within the City Hall. The hearings were attended by over 50 citizens, journalists and officials.

At the same time, the conference was broadcast online by privesc.eu and was watched by 60 000 users.

The event was also broadcast live on the Facebook page, where it was viewed by 2.500 users. The high interest of the citizens proves once again that there are problems in this area and it is the duty of the authorities to propose effective measures to solve it.

During the hearings, the main concern expressed by several participants referred to the possible disadvantages of this merger such as: substantial reduction of staff (especially drivers/tax collectors); incompatibility of organizational culture; failure to achieve planned savings.

But all these risks can be avoided if there is a model action plan or road map that will easily guide participants in the merger process.

For example, with regard to reducing staffing, it is important to note that staff turnover in the case of drivers is very high.

Thus, the negative impact could be minimized by gradually reducing employment.

IV.8. Administrative integration

Reducing management functions, excluding duplicate functions and improving staff management could help increase productivity and reduce wage costs. Reaching a level of 5 employees per transport unit would produce a saving of approximately 120 million lei per year for the company (increasing labor productivity, reducing management functions; reducing the number of drivers; reducing the number of workers in parks).

²⁴Chisinau Public Transport Project: Consultancy Program on Public Transport Regulation and Restructuring

A model Action Plan for the implementation of the merger and then of the quality management is presented in Annexes 9, 10 and 11 .

CHAPTER V

CONCLUSIONS

The merger of municipal transport companies is an exercise with several financial and operational benefits for Chisinau, starting with lower costs for operating the entire system, better coordination of routes and operating schedules, a de-congestion of the city center, but also the possibility to offer the client a unique tariff system, with the possibility of transshipment within the selected tariff or area and a good chance to reduce the financial burden on the municipal budget.

The analysis of the operational implications of maintaining the merger of the two public operators in Chisinau leads to the conclusions set out below. The merger of the two public operators does not appear as an absolutely mandatory condition for the improvement of the activity, but the good practices in the field, validated by results, strongly recommend such an approach. The Consultant considers that maintaining institutional separation carries with it the risk, if not the certainty, of the aggravation of the problems reported and the difficult and uncertain application of any separate remedial measures.

Given that the pressure on the local budget is constantly increasing and has already become unsustainable in the medium and long term, a substantial increase in revenue is mandatory. A new and unique tariff offer must be built, starting with an increased basic tariff in line with the economic developments in the Capital, simultaneously with the reduction of subscription tariffs. In this way, loyal travelers, who constitute the vast majority and who depend on the daily use of public transport, will be favored. New tariff products can be added (subscriptions for an urban line, subscriptions for an urban line plus a suburban one, etc.), possible with the current technical endowment and mentioned in the dedicated chapter. In addition to a more commercially correct tariff offer, the ultimate goal is to increase revenues by at least 50%. Receiving the travel tax in advance by subscription, equivalent to a short-term loan without interest and conditions, would also lead to financial relaxation due to improved *cash flow*. The consultant presented several possible scenarios and recommended the basic tariff of 5 lei, the monthly subscription of 160 lei and the rest of the existing tariff products modified accordingly, or established according to the usual rules for the new ones. The merger of the two public operators would facilitate this process, stopping the increasingly unproductive trend of different taxation of the same public service.

Steps are needed for the State to assume the coverage of the amounts not collected by the operators as a result of the establishment, by republican norms, of the right to free travel for some categories of persons. It is a basic principle that the authority imposing fare facilities should transfer the appropriate amounts, because a public transport operator cannot and must not assume social protection tasks.

Investments, even pilot projects in the operational area, must have a unitary character, with the same facilities and procedures and, above all, with the same interface to

passengers. The merger of the two operators would facilitate this process, a fact highlighted by the different way in which it was conceived and in which the pilot project is currently being implemented at the two operators for the payment of the contactless bank card ticket.

It is necessary to implement, in the medium term, an Automatic Charging System that uses both transport cards and bank cards and that allows the diversification of the tariff offer and payment methods, securing the entire chain of commercial procedures - issuance, payment, validation and control, simultaneously with obtaining complete and objective reports on route loading, receipts, types of passengers, etc. Maintaining the institutional separation of the two public operators would make it very difficult to carry out this project.

Ticket sales through approx. 960 tax collectors (from both companies) is an anachronistic practice, for which no similar examples can be found and which generate high and unnecessary operating costs. The abandonment of this procedure, which is normally intended for a minority of travelers anyway, must be considered in overcoming the fear of increasing fraud.

Along with increasing revenues, reducing operational expenditures by optimizing routes is the second important lever for reducing pressure on the local budget. Even in the absence of accurate data, it is clear to the consultant that there are problems of parallelism, over-bidding in small localities and counterproductive bringing of suburban bus routes in the center of Chisinau. The financial operating parameters and the characteristics of the bus mode require that the main action be the partial reconfiguration of the current PUA network. The consultant made some possible recommendations with the available data, but the exact location of the nodes for shortening bus routes in Chisinau, the elimination of duplicate routes in the suburbs and the financial effect of these changes will be determined by local specialists, based a better knowledge of the real situation on the ground. The merger of the two public operators would make possible a coordinated and unitary action, essential features to ensure the expected positive effect.

The contract for the delegation of the management of the public transport service should not allow operators, whether public or private, to subcontract the service on certain routes from those given to them in administration.

The local authority should consider delegating the management of the public transport service to private operators only insofar as the public operator cannot satisfy the transport demand, with the fulfillment of legal procedures and quality standards.

The prospect of purchasing electric buses adds another argument in favor of the merger of public operators, as they will not have from a technical point of view anything in common with conventional, heat-powered buses. On the contrary, they will be practically trolleybuses without a trolley, but needing charging stations for the battery. Assuming that they will be purchased by the PUA, or will be entrusted for operation to the PUA (because they are “buses”), the arrangement of facilities for technical

maintenance will be counterproductive as long as RTEC has the necessary facilities for electric vehicle maintenance. Even charging stations can be made easier in trolleybus garages, based on new traction substations, which are the subject of another project.

The coherent and unitary operation of the public transport service also requires an improved public communication activity, first of all in the increasingly used *online environment*. Noting the way in which this communication is currently carried out, with different web pages as structure and having incomplete or misplaced information, it can be concluded that the merger of the two public operators will ensure better conditions to achieve this goal.