

## ANALYSIS OF TRANSPORTATION IN CLUJ

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*Abstract: From a socialist society where public transit was the primary form of transportation to the modern “Silicon Valley” of Eastern Europe, where the streets are flooded with cars. Cluj has changed over the years; overturned by university students for most of the year, the city and encompassing communes have experienced significant growth, which stresses the existing socialist infrastructure and causes high levels of strategic planning to accommodate the present and future transportation plans. Moreover, the CTP is no exception; as the only provider of public transportation in Cluj, it is at the centre of this predicament and needs to distinguish itself as a success within Cluj to provide for the community's needs. In this paper, we look at data from multiple sources to analyze what drives people's choice of transportation and pinpoint some fundamental notions as to why people choose private vehicles and other forms of transportation over public transit. Then, using SWOT and PEST analysis, we look to find solutions to benefit the community. Many options are available to develop more fluidity in the city, change the notion of public transportation, and create reliance on public transportation.*

### **Introduction**

Cluj-Napoca is known as the capital of Transylvania, and it is also known for its rich history characterized by various periods and cultures. Situated in the country's western region, the city has markedly transformed over the past decades from a modest city into one of Romania's most dynamically developing urban hubs that has had a considerable impact throughout its metropolitan area. Its top-ranked universities offer over 300 specializations and contribute to a highly skilled workforce. This city is also known as Eastern Europe's “Silicon Valley,” attracting business leaders and large firms due to its high quality of life and excellent workforce. (Intodeauna pentru clujeni, 2018). Since the 1989 revolution, which transitioned Romania from a socialist government to a democratic state, Cluj-Napoca's growth has been remarkable, especially following its entry into the European Union in 2007. However, developing a democracy takes time and effort. Romania is still changing to meet European standards. Cluj stands out in this evolution, transitioning from an industrial economy to a knowledge-based job market. This rapid growth in a City designed hundreds of years ago often leads to positive and negative results; this is often the case when cities expand to meet population growth while continuing to strive to provide a high quality of life. This paper will focus on developing a strategic plan for CTP Cluj's public transit provider, analyzing the current status, and improving the little strategies to achieve better functionality.

### **Analysis of Cluj from 1989-2018**

Looking back at the city's urban landscape and the creation of new means of transportation in the world, we see that there have been significant transformations. Within the Romanian socialist system, we see that development resulted in compact cities; this approach to

planning remained the strategy until the year 2000. Nonetheless, the post-socialist Cluj-Napoca showed a significant amount of urban sprawl, which became a primary mode of expansion to the City; this is also due to the physical constraints of the land around the City. In the 1990s, Cluj was an industrial hub and a leader in the academic and medical fields. The city has now transformed, and many people have migrated to the surrounding towns, which rely on services only found in the City. This is still the case as we see people choosing to live on the outskirts of the town but still within reach of the services of the central city. The referenced below (Tosa & Mitrea, 2017) illustrates the changes in population distribution and urban expansion.

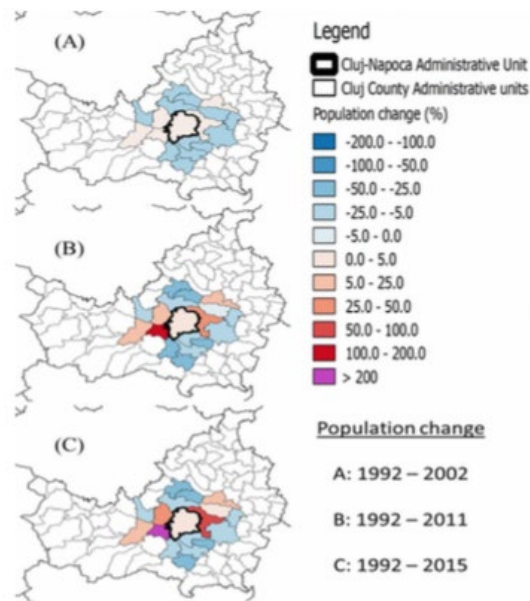


Fig. 1. Population distribution over time within CNMA

The mobility landscape in Cluj-Napoca has shifted dramatically since the 1989 revolution as we saw an increase in private car ownership; moreover, as mentioned previously, urban sprawl has led to a mobility crisis and an expensive real estate market. These changes raise questions about sustainability and the impact on the quality of life in most of Romania, known for its culture, sports, and food. Still, Romania deals with problems such as traffic congestion in high-density city centers and a lack of highways throughout the country. Regarding public transit, CTP Cluj was not the first transit company in the city; public transportation was first introduced to the City in 1883 with the first tram system, followed by a locomotive in 1890. (C.T.P., 2015) Over the years, public transit has evolved to meet the transforming community's needs; during the socialist era, its primary function was to connect residential neighbourhoods to the industrial areas; for most workers, this was the only way to get to and from work. Initially, buses were the sole mode of public transit until the introduction of trolleybuses in 1959. By 1987, the demand for public transit was so high that a tramline (still operational today) was established. Due to severe fuel shortages and restricted car ownership during the socialist era, public transit was the norm. If, by

chance, you did have the luxury of owning a vehicle during the socialist era, some restrictions limited one driving day based on license plate numbers. However, the infrastructure was generally adequate for the commuting needs of most of the population during that period. (Tosa & Mitrea, 2017)

After the fall of the socialist government, Cluj-Napoca and most of Romania had a significant shift to an open market, which allowed private companies to enter the market. Moreover, we saw an overflowing of international goods available on the market, including cars; as such, there was an increase in car ownership, which was something not anticipated nor planned for. The changes impacted many sectors, including mobility and transportation. Some key statistics which show significant changes since 1989 are as follows: (Tosa, et al., 2018)

The road network in Cluj-Napoca expanded from 342 km to 403 km. The car fleet in 1990 was approximately 54,000 vehicles. By 2016, it had reached 200,000 vehicles.

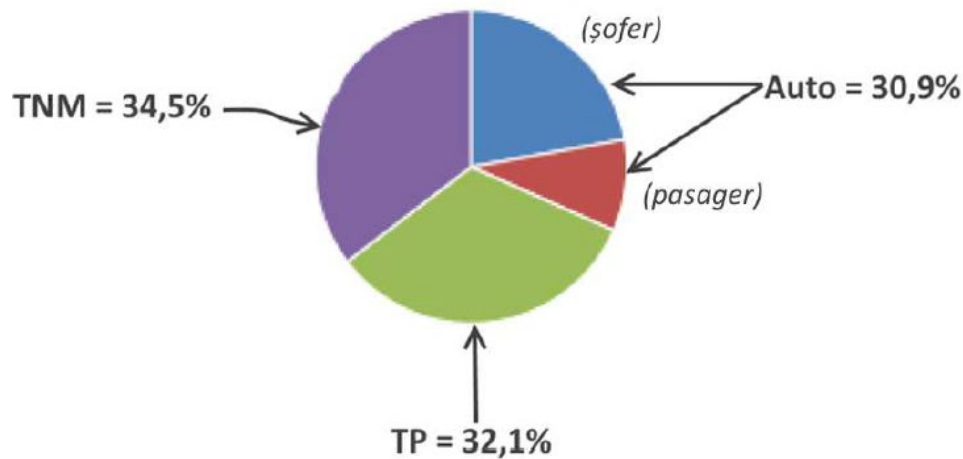
This surge in car ownership, coupled with a minimal increase in road infrastructure, indicates that the city's socialist-era infrastructure was not growing at a fast enough pace to accommodate such a large number of vehicles; this also does not take into consideration the lack of parking, as most apartment buildings built by the socialist government did not provide underground parkades or surface parking for the owners. The lack of sufficient parking spaces led to the practice of curbside parking, further reducing traffic flow.

Cluj has now evolved into a business and academic hub, offering employers a high-quality workforce and citizens a high quality of services and life. As such, the City is considered the unofficial capital of Transylvania. Looking just at the population metrics in the areas, we see that many people choose to move to the outskirts of the City due to the big gap in the affordability of housing in the City versus outside the City. For example, an apartment in the city center exceeds 2300 Euros per square meter, whereas an apartment in the surrounding villages and communes is around 1000 to 1500 Euros per square meter. Moreover, the housing outside Cluj offers more green space and parking, which is hard to find in the City.

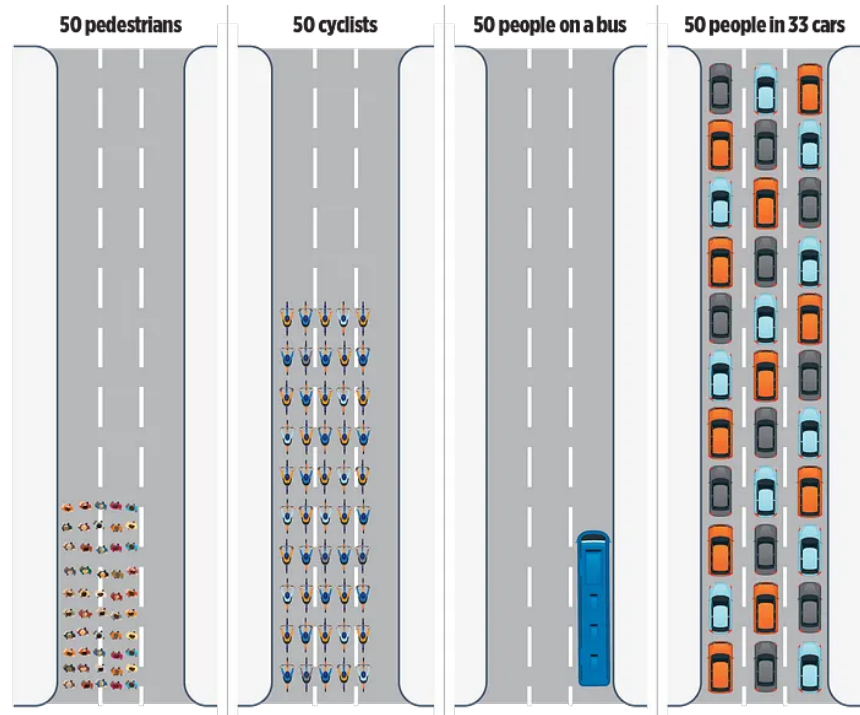
Nonetheless, the population growth and urban sprawl into these areas of the metropolitan area have implications for planning, specifically public transportation and road infrastructure, as people are required to commute regularly into the city for work, education, and services.



Looking at the table above, we see the statistics of the demographic shift in Cluj; this led to significant traffic and congestion challenges, especially during peak hours, as the City has a handful of access points due to the topography and limited road network, which connects to the Metropolitan area. During peak hours, it. The Cultural Centre study results in the table above highlight that about one in five people commute to and from Cluj for work. This translates to approximately 38,000 people travelling to the city for employment.(Vrabie, et al., 2018). The study that the city completed as part of the future transportation and mobility plan also notes some essential statistics, explicitly noting the type of mobility means during the peak hours of 6 am – 10 am. The study categorizes travellers on their choice or mode of transportation; this includes public transit (TP), non-motorized means such as cycling or walking (TNM), and lastly, distinguishing those who choose a car (Auto) and further breaking down the data to differentiate between passenger and driver.



Reading through the report, we could see that the current situation in Cluj-Napoca regarding transportation means, modes and patterns, particularly during peak hours, presents a complex challenge, as space is limited and time is short. On a positive note, we can see that the primary means of transportation is public transit over private vehicles; however, bus overcrowding and many individuals driving alone contribute significantly to congestion. This comes back to the argument of space on the road vs ridership. Below is an image showing the amount of space needed to move the same amount of people using different types of transportation. We could see a vast difference between 50 people in 33 cars and 50 on a bus. It comes down to preference and what is accessible or alluring to one's needs.

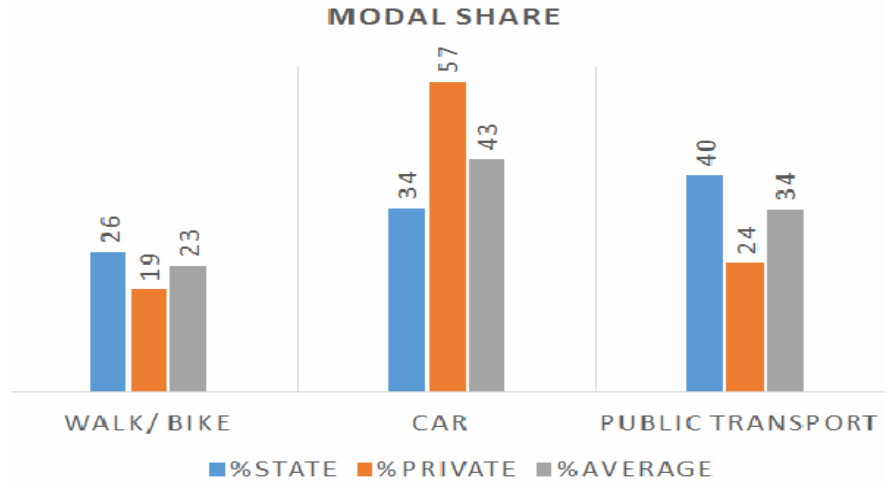


A study by Cristian Tosa and Andrei Mitrea provided valuable insights into transportation preferences within different sectors of Cluj's workforce. Hopefully, we can see why people choose one means of transportation. Using a questionnaire distributed to firms and public institutions and through an online platform, they garnered 804 responses over 60 days; the demographic mainly consisted of women between the ages of 26 and 65. (Tosa & Mitrea, 2017) See below some of the results.

**Table 1.** Socio-demographic characteristics of the sample

Characteristic	Details	State (%)	Private (%)
Occupation	Respondents	61.35	38.65
Gender	Female	74.00	59.52
Age intervals	<25	3.00	15.87
	26...45	47.50	78.57
	45...65	43.50	4.76
	>65	6.00	0.79
Marital Status	Married	67.50	50.00
Drivers licence	Car	67.00	83.33
Income intervals (in RON)	900-1500	29.00	10.32
	1501-2500	48.50	14.29
	2501-3000	0.00	8.73
	>3000	22.50	66.67

The results of the share of people that take non-motorized means of transportation vs public transportation vs cars are as follows,



The study concludes with many facts based on the results of the questionnaire. It is apparent in the data that the private sector relies more on personal vehicles, and state employees are equal across the three options; nonetheless, they still rely more on public transportation as the primary means of transportation. Within the same research, the authors could pinpoint the time to the nearest transit station and the distance to work for each sector. The results showed that half of all respondents live within 7 minutes of a transit station, and the difference between the private and state employees is so insignificant that this cannot be the reason for the difference in choices.



The insights from the study on transportation patterns in Cluj-Napoca reveal exciting aspects of the city's spatial organization and its impact on transportation choices. Two key observations can be drawn from the study:

Looking from afar at the study presented by Tosa and Mitra, we could draw a few different conclusions and notions. Firstly, government buildings are concentrated in the city's historic centre. This benefits state employees as most major transit routes lead into the City centre from all points of the city.

Secondly, newer housing developments in Cluj Napoca and the surrounding metropolitan area provide at least one parking space per apartment; parking in the more recent builds on the outskirts of town encourages the use of privately owned vehicles.

Thirdly, we can conclude when looking at the total travel distance based on the data provided, that the distance between home and work does not influence the transportation choice. This suggests other reasons for the choice of transportation (convenience, comfort, personal preference, etc.) Younger private sector employees tend to avoid public transit, which increases congestion and pollution.

The findings of this study highlight the complexities and decisions which everyone contributes to the more significant issues and challenges regarding traffic and pollution within Cluj. Another study by Cristian Tosa and a few other authors collected data on commuting to work in Cluj; they interviewed 544 respondents on transportation choices, distance to work, and time to get to work. (Tosa, et al., 2018)

*C. Toşa et al.*

**Table 1**  
Share of transport modes in terms of travel distance (TD) and travel time (TT).

Mode of transport	No. of respondents	Percentage	Average TD (SD) (km)	Average TT (SD) (min)
Walking	76	13.97	3.18 (1.11)	32.55 (21.46)
Bicycle	10	1.84	3.51 (0.78)	24.1 (9.26)
Private car/ motorcycle/ taxi	222	40.81	5.80 (3.27)	34.57 (18.16)
Public transport	236	43.38	5.67 (3.49)	44.76 (19.64)
Total	544	100		

The study offers exciting conclusions by showing commuting patterns in Cluj-Napoca and revealing how different demographic factors influence transportation choices. The study highlights several key trends:

Males are more inclined to use private motorized transport (PM).

Females show a preference for public transportation (PT).

Individuals aged 45+ tend to use public transportation.

Those under 25 prefer non-motorized (NM) means of transport.

The 26-35 age group shows a higher usage of private motorized transport.

Respondents with lower levels of education are more likely to use public transport.



Lower average household incomes correlate with a higher dependence on public transportation.

Higher-income households tend to use private motorized transportation.

A significant portion of the respondents (428) have more than 30 minutes of commutes.

People who spend the least money on transportation are those who commute.

The findings paint a fundamental picture to understand the commuting choices in Cluj and the surrounding metropolitan area; the data shows a combination of socio-economic factors and variables such as age, education, and gender, which all play an essential role in the influence of transportation choices.

Table 2  
Sample descriptive statistics based on commuting mode.

Variable	Element	NM (%)	PM (%)	PT (%)	Total sample size
Household size	Single person <sup>(f)</sup>	18.92	32.43	48.65	37
	2 <sup>(f)</sup>	16.45	39.47	44.08	152
	3 <sup>(f)</sup>	13.89	44.44	41.67	180
	4 or more <sup>(f)</sup>	16.48	40.34	43.18	175
Gender	Male <sup>(b)</sup>	14.13	55.12	30.74	283
	Female <sup>(b)</sup>	17.24	25.67	57.09	261
Age cohort	18–25 <sup>(f)</sup>	21.21	33.33	45.45	33
	26–35 <sup>(e)</sup>	15.11	50.36	34.53	139
	36–45 <sup>(f)</sup>	16.25	45.63	38.13	160
	46–55 <sup>(e)</sup>	12.68	33.10	54.23	142
	> 55 <sup>(f)</sup>	18.57	31.43	50.00	70
Type of employment	Public <sup>(e)</sup>	16.57	28.99	54.44	169
	Private <sup>(e)</sup>	15.20	46.40	38.40	375
Marital status	Married <sup>(f)</sup>	15.97	34.72	49.31	400
	Not married <sup>(f)</sup>	15.50	43.25	41.25	144
Average household income (in RON) <sup>a</sup>	< 1000 <sup>(e)</sup>	9.68	19.35	70.97	31
	1001–2000 <sup>(e)</sup>	16.07	27.98	55.95	168
	2001–3000 <sup>(f)</sup>	20.30	29.32	50.38	133
	3001–4000 <sup>(e)</sup>	14.29	53.25	32.47	77
	4001–5000 <sup>(b)</sup>	7.55	66.04	26.42	53
	5001–6000 <sup>(b)</sup>	7.69	69.23	23.08	26
	> 6000 <sup>(b)</sup>	19.64	66.07	14.29	56
Monthly transportation expenditure (in RON) <sup>a</sup>	< 50 <sup>(b)</sup>	36.36	9.09	54.55	22
	51–100 <sup>(b)</sup>	16.95	12.71	70.34	118
	101–200 <sup>(f)</sup>	17.53	32.47	50.00	156
	201–300 <sup>(f)</sup>	14.89	47.87	37.24	92
	301–400 <sup>(b)</sup>	10.53	70.18	19.30	58
	> 400 <sup>(b)</sup>	10.10	71.72	18.18	101
Time travel to work (min)	< 10 <sup>(f)</sup>	28.57	42.86	28.57	7
	11–20 <sup>(f)</sup>	20.00	30.00	50.00	40
	21–30 <sup>(f)</sup>	21.74	37.68	40.58	69
	> 30 <sup>(f)</sup>	14.02	42.52	43.46	428
Driving license	Yes <sup>(a)</sup>	15.49	52.35	32.16	426
	No <sup>(a)</sup>	16.10	0.00	83.90	118
Cars per household	0 <sup>(a)</sup>	14.86	0.00	85.14	74
	1 <sup>(d)</sup>	19.66	36.27	44.07	295
	2 <sup>(b)</sup>	9.72	65.97	24.31	144
	3 or more <sup>(b)</sup>	6.45	67.74	25.81	31
Education	Bachelor and below <sup>(f)</sup>	13.27	36.22	50.51	196
	Master and above <sup>(f)</sup>	16.95	43.68	39.37	348
Type of residence	Individual <sup>(f)</sup>	19.35	44.35	36.30	124
	Apartment <sup>(f)</sup>	14.52	40.00	45.48	420



**Table 3**

Selected attitudinal statements based on the choice of commuting mode.

Attitudinal statement	Level of agreement	NM (%)	PM (%)	PT (%)	Total sample size
Inappropriate public transport network structure	Fully agree	17.01	41.16	41.83	105
Car is needed in daily life <sup>a</sup>	Fully agree	10.43	69.13	20.44	230
Traffic is congested in the city	Fully agree; Agree	16.63	40.88	42.49	512

The data within the last two tables from the study (tables 2 & 3) shows a lot of essential facts, which I will resume below :

The majority (94%) of the responses from the study note that traffic congestion is a significant issue in the city; the consensus is for the need for improvements in traffic management and an updated transportation plan to account for the proposed and actual growth within the City.

Around 42% of respondents believe a car is necessary for daily activities. This reliance on private vehicles contributes to traffic and indicates the need for more efficient and appealing public transport alternatives. However, one must be realistic in what one can propose, as people are unwilling to let go of their cars overnight.

Only 19% of respondents view the current public transportation system as unacceptable. This surprised me, as this low percentage suggests that while there are concerns about the public transport system, the genuine concern is the congestion in the city and not specific issues with the transit system.

When looking at the usage of the university pass, only 37% of the university students accessed their free monthly pass, which is a significant underutilization.

### **Actual CTP Cluj**

By looking at the evolution and the current state of the CTP Cluj, we can see that there have been legal efforts to provide change and aspire to provide an adequate mode and service throughout the years since 1989:

Transition from "Regia Autonoma de Transport Urban de Calatori" to CTP (1991): This change marked the shift from a socialist government-run entity to a commercial public company responsible for buses, trolleys, and trams.

Key Activities include maintenance, reconditioning, and inspections of public transit vehicles.

Legal and Operational Framework: CTP operates as a public company under Romanian law (OUG 109/2011), coordinating and monitoring activities by the local public authority. Funding and budget adjustments are subject to approval by the A.N.R.S.C. and the local council. (C.T.P., 2015)

It's a self-governing public company but still under the Cluj city hall wing regarding changes, approvals and infrastructure projects. Unfortunately, there is no general information regarding company infrastructure, hierarchy, developments, hiring strategies, or anything else.

Currently, the CTP administration plan has a lot of promises and ideas, but the main message they convey is that they want to develop and modernize. How? Buying more buses increases comfort and gives more capacity to the overwhelming number of users it serves. The CTP, in its 2016-2019 administration plan, stated that they have seen a 7.3% rise in usage of public transit systems since 2015. The document itself states principles onto which they based their four-year strategy:

Economic efficiency

Professionalism

Environmental protection and conservation

Ensure the hygiene and health of the population

Sustainable development and its correlation with the requirements of the population in the area of competence of public transportation

Offer higher quality service than that of a potential competitor.

Transparency and free access to information regarding the service provided

The universality of the public service provided.

We can understand that focusing on and applying these eight principles can improve public transit in Cluj. Unfortunately, detailed information about the company's internal operations, implementation and monitoring of these eight principles is unavailable; therefore, a comprehensive understanding of the operational umbrella is difficult to map. However, we note the number of assets currently in operation as we can see how many buses, trolleys, and trams are owned by the company and how many routes are used within the city and in the metropolitan area.

The company itself has been constantly updating its fleet. The CTP website states They have 250 buses, 84 Trolleybuses, 27 Trams and ten smaller busses. (CTP, 2019). As for infrastructure, currently, the CTP has 66 bus routes within the city of Cluj-Napoca that span more than 100 km, on which they have 250 bus-type vehicles operating at maximum capacity. One hundred fifty buses run at once during working days and around 70 during weekends. This comprises 65% of all public transit. The other 35% comes from trolleybuses and tramways. (Varga, et al., 2016).

In recent years, more updates have come to the busses and the ticketing system, all of which have been striving in the right direction. It has incorporated ticket purchasing options through SMS or texting; one could SMS and send the bus number through the mobile banking system. The authorization would allow for one trip, 1-hour trip or a one-day subscription. They have also implemented free and discounted passes for certain age groups and specific people. For example, if you are a blood donor, you can claim a 50% discount on subscriptions; elementary and high school students receive a free pass if they are enrolled. Retired people receive one bus route accessible, people with disabilities receive all-access passes, people who are unemployed and receive unemployment insurance payments receive one route accessible for one month, and orphans receive all

routes, which need to be renewed monthly. All this is to say that it is a step in the right direction; nonetheless, we could see improvements. <sup>1</sup>

### SWOT analysis:

Strengths	Weakness
<p>Transportation authority consolidated under one entity.</p> <p>Experience with other potential market threats.</p> <p>Long-standing collaboration with the municipality.</p> <p>Monopoly on Cluj's public transportation system.</p> <p>Access to European funds.</p> <p>Socialist culture, which was the community's core for so many years, has public transit as the primary source of transportation for most.</p>	<p>Being a public company, it must service all areas regardless of whether it is profitable.</p> <p>Urban sprawl and developing communities are more complex to reach as roads are privately owned and not up to code.</p> <p>Top-down approach (bureaucratic layers of an existing structure).</p> <p>Certain times during the day experience high traffic, which impedes the provision of efficient services.</p> <p>Providing transit for a city planned for a different time and population size.</p> <p>The lack of managerial culture within the public sector.</p>
Opportunities	Threats
<p>Update of the fleet through European and city funds.</p> <p>A new proposed tram/subway will link the nearby communes.</p> <p>Partnership opportunities within the community with vital, well-known private companies.</p> <p>Advertising revenue possibility for firms within busses.</p> <p>The community is booming, with well-educated university students ready to hire anytime.</p> <p>Green sustainable movement driving force to switch from diesel to more efficient power means.</p> <p>Invest in the people working within the company and give them incentives to feel part of the growing potential.</p>	<p>Hierarchy disputes between city hall and company</p> <p>Update of the system can be lengthy and cause delays</p> <p>Laws in Romania change rapidly.</p> <p>Fossil fuel prices not steady</p> <p>Technology is changing so fast that it is hard to keep up.</p> <p>People constantly keep moving to the outskirts of town or other communes that surround Cluj; the population of Cluj drops while the communes rise and need adequate public transportation.</p>

### Pest Analysis:

**Political Factors:** CTP is a public company with many bureaucratic layers and processes; this could create challenges as it can take minimal risks with public funds and must abide by the methods, regulations, and directives in which public companies operate.

**Economic Factors:** The price of oil is market-driven and fluctuates, which constantly affects the bottom line profits as the ticket price does not consider daily oil prices; this makes it challenging to predict operational costs. Furthermore, when looking at the rising income rates and the opportunity or access to private car ownership, one can only expect that more private car ownership will negatively impact the ridership of public transportation.

**Social Factors:** Demographic changes, as mentioned previously, urban sprawl to the metropolitan areas that lack public transportation services, require CTP to begin now to

<sup>1</sup> <https://ctpcj.ro/index.php/en/fares/urban-transportation/free-subscriptionsgm/357>

extend further outside of their previous reach—the social pressure to understand the environmental awareness which calls for sustainable changes to the fleet.

Technological Factors: Rapid transportation technology advancements are complex for public companies to maintain. However, services should be offered on par with what the market offers.

*Competitive advantage:*

One might say that the fact that it is a public company that does not have any direct competition would be the first advantage to the CTP; however, this may be a double edge sword because the lack of competition creates a monopolistic state sense of stagnation and lack of catalytic development to keep up with the competition. (Hintea, et al., 2012) Which, per se, makes it so that the strategic planning process doesn't always happen. Therefore, the "monopoly" on public transit in Cluj is if CTP engages in proactive strategic planning to continually enhance services provided and avoid stagnation in keeping up with the demands of the growing population.

Access to non-refundable funds, whether that be tax dollars from the budget or direct European funds for improving infrastructure

Social benefit and access for everyone - Public Good

Proven sustainable budgetary system and track record within the community.

Developed infrastructure within the city.

**Creating a new strategic plan - CTP**

A strategic plan for the Compania de Transport Public Cluj-Napoca (CTP) should be focused on the end user and the environment in which it operates. As such, this would focus on creating an efficient and sustainable system that prioritizes the end user (customer service oriented). The following are the proposed Vision, Mission, Values, and Goals presented:

Vision: To provide high-quality service through innovation and deliver efficient, modern transportation solutions to Cluj and the surrounding metropolitan area.

Mission: To unite the city and communes within the metropolitan area by developing affordable and universal public transportation to the entire metro area.

Core Values which should be implemented in CTP

Customer Service: This would be to prioritize the end user. This can be done by actively seeking feedback to gauge what needs improvement to, in the end, uplift the customer experience in all aspects of the company.

Sustainability: This is not about just looking at the bottom line; CTP is a public entity and should seek a holistic decision-making process that looks at the environmental, financial and specific community considerations in all decisions to support the metropolitan area's ecological goals.

Responsibility: As a public company, it does have economic accountability and should ensure that public funds are appropriately managed.

Openness/Transparency: As a public company, there should be access to data, plans, and budgets to ensure trust and grow collaborations.

Quality: Provide high-quality services which ensure reliability and safety at the front while keeping up with innovative changes in the industry.

The goals and objectives would be as follows:

Expand and modernize the fleet to incorporate more renewable energy sources to reduce the emissions within the City.

Improve Service Efficiency by providing informed route planning based on needs. This would reduce the frequent overcrowding and wait times; however, this must be constantly reviewed and addressed as the ridership needs can change through the seasons.

Seek community feedback and engagement to assess the end user's satisfaction with the services provided and know what can be improved; as such, this will create a continuous feedback loop and keep the conversation going between the service provider and end user.

Update the current infrastructure, such as the existing bus stops, shelters and other related areas, which could create better accessibility and comfort; this should not just focus on the busses, trolleys, and other means but all CTP.

Create means by which payments and renewals of passes and tickets could be seamless and not require stepping through bureaucratic red tape.

Proposed operational solutions and policies:

Looking back at the data presented near the paper's beginning, the critical element of one of the conclusions was that 512 out of 544 people questioned agree that traffic is congested in the city = 94% of respondents. We have a crowded city due to the high density of revolving public services and companies within the downtown core of the old town. I propose managing them somewhat and creating a transit-oriented society that does not revolve around policing or ticketing but understanding how the community should function. This is a romantic statement. Nevertheless, there could be some lessons we could apply to encourage people to take public transit instead of cars.

The first would be a reform to the ticketing system. We cannot keep using single or two-way tickets as our central ticketing system. I propose removing the two-route system and implementing all-access passes and zone travel areas for the same price. This means that with this single ticket purchased, I could travel for a limited time within this zone/area; if I want to enter another zone, I will need to upgrade my ticket. However, this gives more mobility, especially to people who stay in the downtown area and need 2-3 buses. This will influence people to rely more on public transportation than cars.

The second proposed solution would be to enable boarding process management; this would have people only board from the front of the bus. This creates a line for who was first at the stop and creates order instead of everyone pushing on. People know they are not allowed to enter from any door but the front, making it easy for controllers to see who is trying not to pay. The tap card system would be at the front of every bus, and the bus driver could see when people were not tapping. The bus driver would then have a red button to alert controllers if people have gotten on his bus without tapping or paying using a credit card as a tap. This takes away from the need to have so many people patrolling buses and checking tickets and drastically reduce the cost of service of the CTP.

The third proposal would be to implement High Occupancy Vehicle (HOV) lanes in Cluj-Napoca, which aims to enhance the efficiency of the city's transportation system and address the challenges posed by limited infrastructure and increasing vehicle congestion. HOV lanes are designated traffic lanes intended for vehicles with multiple occupants. These lanes are typically seen in urban areas with heavy traffic and are designed to encourage carpooling. As such, it would help reduce the number of cars on the road. In

Cluj-Napoca, introducing HOV lanes could strategically respond to the city's infrastructure constraints and growing traffic congestion, as this would not add road space but create an advantage for those who do carpool. The program would need to be thought out, however, to create a snapshot of what it might look like: The HOV lanes would only be available during peak traffic hours (7 am to 9 am and 4 pm to 6 pm); during these times when two lanes or more are open, one will become a dedicated lane to those who have two or more occupants in the car, and those who drive electric vehicles. This would then promote carpooling and the use of Electric Vehicles. As such, it would remove cars from the existing roadways to alleviate congestion and encourage using electric vehicles.

A fourth proposal is implementing red light cameras to reduce traffic congestion and promote safe driving practices. In peak hours, it is known that people run red lights to make sure they do not have to wait for the next green; this creates blockages as it could prevent the flow of traffic when one is bumper to bumper. The red light camera would be an automated solution to this problem as it will create an understanding of what is wrong and alleviate the requirement to have an officer direct traffic, which happens often at busy intersections. Red light cameras offer an automated solution to this problem as these devices are designed to capture images of vehicles that violate traffic signals at intersections, which then could change the culture of running red lights, promote compliance, create better traffic flow, enhance road safety, resource efficiency (no need for officers) and could be a revenue source.

A Fifth proposal would be free access to all children, youth and teenagers (Everyone under 18) and those who have reached the legal age to retire with a Romanian ID (63 for women; 65 for men). This is to build on what has been done in the past years for the bus system; currently, if you are a pupil, you get a free; if you are a retired pensioner, you receive one line for free. The administration of this program is costly because creating a free age range would allow no ticketing to be required; show your ID when entering the bus or to the driver or controller when asked. Implementing this strategy will create an early ridership culture and give mobility to the more vulnerable population.

Lastly, a proposal would look to create and establish a partnership between the CTP and the private sector in Cluj to create more incentives and access to public transportation among the working sector. I was inspired to suggest this from the existing 7-card program offered to employees who work for companies that opt into the program, discounted or free access to multiple fitness facilities within the City. The cost is shared between employees and employers; however, it offers a reduced rate to various fitness facilities and fosters a culture where one can access these services at a reduced rate; similar to this program, the creation of a pass for the private sector where employers participate and partially pay or fully pay for the employee pass as such making public transit even more attractive, this initiative would reduce traffic but more importantly promote the public transit ridership culture in the private sector.

### **Proposed strategic elements in publicly provided transportation**

The notion of a 'developed' country is often tied to economics, such as GDP, but the reality is that a country's GDP doesn't necessarily affect the local government. The mayors of Bogota Columbia, Enrique Penalosa and Gustavo Petro, assert that a developed country is not a place where people with low incomes have cars. It's where the rich use public transportation. It suggests a paradigm where public transit efficiency and convenience

make it the preferred choice for all, regardless of economic status. This is the definition of a developed country, which is problematic as it shifts from materialistic values and creates equality, sustainability and community welfare. The ideal community is where all essential services, such as healthcare, education, and transportation, are attainable. Plato and Aristotle both advocate for the social well-being over the individual gain. As divulged in the report, many social factors affect transportation choices. It would be near impossible to please all; nonetheless, the goal is to grasp the collective needs.

Cluj-Napoca is an excellent example of the complexities of post-socialist infrastructure and political bureaucracy, yet we still see efforts to enhance the transportation system through these challenges. There are many different options available. However, the path forward should focus on collaboration, cooperation and participatory decision-making involving all stakeholders. When trying to achieve a new level of understanding and cultural shift. People might not always be on board with new policies, but it is good to hear all parties and have participatory action on the objectives that want to be followed. That being said, there also needs to be measurable outcomes so that we can see positive growth and not stagnation. The strategic approach of the company should be visible from three main perspectives: environmental perspectives, decision-making analyses and perspectives that are centred on leadership analyses (Hintea, Hamlin, & Hudrea, 2012); each point of view could skew or reinforce the CTP in the formulation of the direction of the future, to be able to satisfy the needs of the community.

In conclusion, the transformation of mobility in Cluj-Napoca, and by extension in any evolving urban landscape, is more than just implementing new technologies or policies; it falls on the idea of change, changing attitudes, changing values, and fostering a culture where public transportation is the best choice, the most advantageous choice. This journey, while challenging, is essential for realizing the true potential of a 'developed' society in the modern era.

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