- Achievement of 100% of buses equipped with video surveillance systems (83.7% in 2017)		
• Reduction of the recorded noise level		In 2020, the following friction moderating systems were installed: • 3 in Rozzano; • 2 in Mercato Tivoli; • 1 in Sempione at the corner of via Domodossola.

The Manufactured Capital of ATM Group

As a public transportation service provider, the modernization and maintenance of production capital represents a fundamental element for ATM Group - maintenance of corporate assets, specifically in reference to the average age of the fleet, is subject to regulation by European directives and the provisions of the Service Contract stipulated with the Municipality of Milan. However, it is a key factor in the sustainability of the business for the Group not only because it ensures compliance with the regulatory requirements but also because it guarantees a consistently high level of service over time.

For that reason, the Group upgrades the company fleet on an ongoing basis and to develop a modern and efficient support infrastructure to achieve ever higher levels of performance in terms of the environment, accessibility and comfort.

Public health emergency impacts on manufactured capital

In relation to COVID-19, during the lockdown period there were business interruptions mainly in the field of plant and infrastructure construction sites, where the companies involved had to reduce their activities.

As part of the framework agreement with Hitachi Rail Italy for the supply of Leonardo trains, the health emergency impacted the supply, delaying the delivery of 4 trains, causing the completion of the order to be postponed to 2021. Throughout 2020, 11 of the 12 contracted trains were delivered.

Modernization of the fleet

During 2020, the ATM Group allocated approximately 112.6 million euros to the renewal of the company fleet. With regard to the M1 and M3 metro lines, in 2020 the procedures for the purchase of 21 trains for the M1 line were initiated, replacing the trains categorized for "revamping" (for the restyling that took place in the past) and 25 trains for the line metro M3 that can be used, with minimal modifications and with the upgrade of the on-board signaling system, also on the M2 line.

The Group makes these investments in order to generate positive repercussions for the performance of transport services and in terms of customer experience - thanks to the improvement of the quality of the service and the relative levels of comfort and accessibility - but also to improve environmental performance and vehicle safety levels.

Upgrading transportation as a means for improving environmental performance

In order to upgrade and improve the performance of the public transport network, the fleet renewal plan, which provides for the replacement of older vehicles with more modern and efficient vehicles, will allow the ATM Group to lower emissions into the atmosphere deriving from the fleet.

Following the Full Electric plan, the change of surface vehicles towards a zero-emission bus fleet that began in 2018, ATM has begun transitioning to hybrid buses, taking into account that the market is not yet able to meet the large requests for electric buses and that the regulations provide for time limits on the use of older vehicles. Hybrid buses allow for significant reductions in both fuel consumption and CO2 emissions. The tender for a framework agreement for 150 hybrid buses is in the process of being awarded. It includes full maintenance service extended to the entire life of the vehicle. Upon signing the framework agreement, the first application contract for 60 buses will also be signed with deliveries scheduled for the end of 2021.

Also part of the Full Electric renewal plan, after the two contracts for the first 25 electric vehicles, which were supplied by the beginning of 2019, in the same year a framework agreement was signed for the supply of 250 electric buses, including full maintenance service extended to the entire life of the vehicle, and of the traction batteries, which will replace those installed in the original system, whose performance is expected to decline at approximately half of the vehicle's life. Together with the aforementioned framework agreement, the first contract was signed for 40 buses whose deliveries were completed in the second half of 2020.

The second contract was also signed, which provides for the supply of 100 buses with enhanced batteries, which became partially available at the end of 2020 and will be completed by the summer of 2021.

To implement the Full Electric project, in addition to the supply of vehicles, it is also necessary to adapt the depots used for housing and recharging the vehicles. To this end, a 5-year framework agreement was signed for the installation of the recharging columns in the warehouses of Sarca, Giambellino and San Donato. In the course of 2020, the installation activities for the columns in the Sarca depot began and are scheduled to be concluded by March 2021. In addition, 2 opportunity charges are expected to be set up respectively at the Zara bus terminus whose works began in the second half of 2020 and the plant which is expected to be installed in 2021.

As regards the bus fleet of the subsidiary NET, the Group completed the plan for renewal of 44 12- and 18-meter buses, divided between the suburban service lot 3 and the urban service of Monza, the last of which entered into service in January 2020. These investments, made in view of the tender for the assignment of the service, have allowed a rejuvenation of 32% of the NET vehicle fleet, while allowing for the disposal of obsolete vehicles with Euro 3 engines.

Taking up the theme of electric mobility, the framework agreement was signed in the second half of 2020 for the supply of 80 25-meter long bidirectional trams, with a lowerable floor in the area of the access doors, to be used on the urban and interurban network. Together with the framework agreement, the first application contract was also stipulated for 30 trams with delivery of the prototype scheduled for March 2022 and subsequently, for the first 10, from September 2022.

As part of the framework agreement for the supply of 80 articulated 18-meter trolley buses, delivery of the 30 vehicles referred to in the first contract were completed in the first half of 2020. For the second contract of the next 50 trolleybuses, the authorization process for the allocation of loans through the Municipality of Milan by the Ministry was concluded at the end of 2020, for which the request for stipulation of the contract was initiated in January 2021 for the spring with delivery of the vehicles starting from mid-2022.

With these investments, the average age of the ATM trolleybus fleet will drop to about 4 years, thus allowing for disposal of all the old trolleybuses, especially the older 12- and 18-meter vehicles. The new trams and trolley buses arriving will offer passengers better quality of service, in terms of comfort and accessibility. They will be updated with the most modern safety requirements, and the trams will be

equipped with an anti-collision system. The new vehicles will provide for the mitigation of noise pollution, they will be equipped with technological systems to allow passengers to connect to the wireless network once on board and will ensure energy savings thanks to the braking energy recovery system.

Finally, in the context of the renewal of the vehicle fleet and in promotion of the Group's sustainability, ATM continued to replace diesel service cars with electric rental cars, to be used for assistance to vehicles, control of operation and maintenance of metro and tram systems. At the time of publication, there are 97 cars are fully operational, 10 cars have recently been ordered and will be delivered in 2021.

In 2020, 70.1% of the distances of all ATM public transport were electrically powered, in particular as of 31.12.2020 the ATM endowment included 66 electric buses and 132 trolleybuses, in addition to metro trains and trams.

Continuous improvement of security

In order to improve the levels of security experienced by the passengers, ATM maintains a constant presence, both in the stations and on board its vehicles, offering safer and better quality of services, thanks to a close collaboration with the police and city authorities of Milan and the implementation of technological solutions for monitoring activities on board vehicles and in stations. The continuous modernization of the fleet also allows for continuous improvement of the security of passengers on board the vehicles.

The upgrade of the technologies used by the Security Operations Center (SOC) was completed in 2019. The SOC was moved to the Operations headquarters where it works in synergy with the Operations Centers of the metro and surface lines, maintaining disaster recovery in its previous location. The SOC is active 24 hours a day, 7 days a week and three specialized Security operators work there, responsible for monitoring and managing the over 6,000 cameras and over 4,000 alarms that guarantee the necessary remote support to Security ATM employees.

In 2020, the Group continued to equip the buses with video surveillance cameras, reaching 94.2% of the entire fleet. Consequently, also in consideration of the lockdown periods, in 2020 there was a significant reduction in the number of attacks on ATM personnel (-37% compared to 2019). With regard to vandalism of underground trains and on surface transportation infrastructure, the Group recorded a reduction in the number of cases by 30%, taking into consideration the lockdown periods.

Management and development of infrastructure

The infrastructure that supports the services offered by ATM, from the underground network, to the stations and offices of the Group, make it possible to provide adequate service performance, and allow for the provision of services that are constantly in line with client-citizen needs and that reflect their expectations.

To ensure the satisfaction of citizens and all those who use the service, providing maintenance of a modern and efficient infrastructure that guarantees high accessibility to the public transport service for everyone is essential.

Guaranteeing accessibility of transportation services

In light of the impact ATM has on the relationship between the citizen and the city, the Group plans the routes of the bus lines and plans the construction of new metro lines, offering a greater level of accessibility to all citizens, especially the vulnerable.

Planning of mobility services in the metropolitan area of Milan is directed by the Urban Plan of Sustainable Mobility (PUMS), which sets the guidelines of the strategies for infrastructure

management, as well as safety, reliability and flexibility towards the customer and his needs. The Triennial Construction Program and the Biennial Supply Program define the short-medium term operational elements of the Municipality for the development of interventions.

In addition, ATM has implemented specific tools which are periodically updated to evaluate the progress, the request and the mobility flows for each means of transportation. Directions for the operations to be carried out - extraordinary maintenance, improvements, modifications - are also implemented through the additional channels set up for this purpose (institutional channels, customers and maintainers).

Safe movement and distancing of trains on the four metro lines operating in Milan are managed via signaling systems capable of sending and managing information on the position of the trains and the conditions of the line. These systems are equipped with a variety of protection technology with different degrees of automation. Safety in circulation of surface vehicles is mainly managed through punctual implementation and maintenance of the technology installed in the vehicles to ensure they continue to function correctly.

As part of the renewal of the M2 line, the Group has planned a complete overhaul of the signaling system. The complete refurbishment of the signaling system, fully financed by ministerial contributions and by the Municipality of Milan, will guarantee a safer and more efficient management of service, allowing an increase in the frequency of passage of the trains and consequently an increase in the transport capacity of passengers transported per hour. In close association with the intervention on the signaling systems, it will be necessary to carry out the timely refurbishment of the armament system. The improvements will be carried out on the sections of the line in which the armament has suffered a decline in the performance of the mechanical components or carried out with technical solutions that do not allow for the increase from 70 km/h to 85 km/h while running.

Accessibility of payment services

Of these types of projects, ATM is the leader in the ticketing revolution taking place in Local Public Transport, facilitating the digital transformation of the public transport in Milan, which today is at a turning point when it comes to ticketing practices. In fact, the Group is committed to guaranteeing accessibility to the services offered, through the implementation of new automatic ticket machines that facilitate ticket purchase, or through the offer of *smart* services that provide for ticket purchase through SMS or App. These *smart* services make it possible to use transportation services without printing tickets through the use of a QR code and, in the near future, NFC technology.

During 2020, the number of turnstiles updated with the new *smart* technology was increased while the catalog of types of tickets able to be sold without printing was extended to the entire range of tickets provided in the Integrated Tariff System of the Mobility Basin (STIBM).

Thanks to this *smart* technology, in 2018 ATM launched an experiment that allows the sale of the ticket directly at the metro turnstiles, implementing payment systems capable of detecting contactless bank cards of the EMV circuit (Europay Mastercard & Visa). This innovative payment system allows access all 4 lines of the entire metro network, guaranteeing the passenger the application of the most convenient rate (best-fare logic) based on the number and type of trips made within 24 hours of the first ticket validation of the day. After two years of operation in the subway, the contactless payment system has also landed on the first bus lines 56, 70 and 73 is planned to be extended also to paid parking lots.

Accessibility of services for people with disabilities

The Group works to guarantee full accessibility to the services offered to the highest possible number of users, paying particular attention to passengers with motor, visual and hearing impairments. To this end, the Group is working to increase the percentage share of stops, stations and accessible means of transport, putting in place specific initiatives:

- Implementation of Infoline, a program that updates the accessibility status of surface and underground lines in real time and provides tools to support people with visual or hearing difficulties
- Installation of tactile routes and protective measures, like LOGES (Guidance and Safety Orientation Line) and automatic doors that protect against the risk of falling, ensuring accessibility of services to passengers with visual impairments
- Redevelopment or reconstruction of bus, tram and trolleybus stops
- Acquisition of trams, buses and trolleybuses equipped with a lowering platform, and revamping of some vehicle segments through the installation of an elevator for the entry and exit of people in wheelchairs
- Installation of elevators and stairlifts in metro lines with systems compliant with the new regulations in force. The replacement of 68 stairlifts, which began in 2019, is almost complete, with the installation and opening to the public of 65 new systems.

The "Information Without Barriers" web platform is under construction, designed to improve information on accessibility to underground and surface transport and to provide it in real time. For this project the company carried out, together with a Group of passengers with motor disabilities and with LEDHA (League for the rights of people with disabilities), an experimentation for the development of the system's functionality starting from the travel experience of the customer.

Table 13. KPI's for the accessibility of ATM transit[12]

% of surface vehicles equipped with a folding platform				
Means of transport	**Target 2020**	**2020**	**2019**	**2018**
Surface lines	75%	84.7	84.0	86.2

% Metro stations equipped with elevators and/or stairlifts				
Means of transport	**Target 2020**	**2020**	**2019**	**2018**
Metro stations	75%	70.2	70.2	69.2

% Metro stations with sensitive floors in the center of the platform				
Means of transport	**Target 2020**	**2020**	**2019**	**2018**
Metro stations	100%	95.7	95.7	95.7

Reduction of noise and vibration pollution

ATM Group has an internal structure, the Vibro-acoustic Laboratory, that is dedicated to measuring and evaluating noise and vibration disturbances from both the company's operating locations and from the public transport (tram, subway, bus and trolleybus) systems managed by the Group.

The measures put into place by the Group's team of technicians over the years have allowed for a more precise analysis of the indicators used to monitor of the vibrational and acoustic impact of the daily activity of the infrastructure, in compliance with the current legislative framework. Based on the results

[12] These indicators do not include the vehicles managed by Nord Est Trasporti S.r.l.

of the analysis, the team began an ongoing collaboration with other technical functions, starting programs to upgrade the fleet of rolling stock and of the components of network systems, as well as provide specific forms of maintenance for rolling stock and metro equipment, in order to prevent disturbance and improve the quality of life of the community.

To that end, in 2020 the Group:

- continued to install new friction moderating systems and update existing systems, to eliminate the screech produced by wheel-rail contact generated by tram cars on tight curves. In total, 6 new friction moderating systems were installed;
- performed an experimental plan for temporary construction activity in 19 sections of the tram network of the Municipality of Milan, concerning grinding and ordinary maintenance of tram tracks with the Man Meccanica - Speno RLT16-EVO road-rail grinding machine of Rail Diagnostics SpA. The results of the evaluation of the effectiveness of the projects were the satisfactory reduction of noise and vibrations produced by the operation of the tram lines present, thus the project will be continued in the future.

The team also continued to manage the structural processes from an environmental protection point of view, in observance of the specific obligations dictated by current legislation, as well as the company's own volition to continue improving its environmental performance.

Among these structural processes is the control of vibrations of train carriages through fixed systems in the underground tunnels. The data from the surveys of these systems are processed and classified, detecting the level of wear of the wheels of the trolleys and scheduling any necessary maintenance work. Since This detection and maintenance process creates significant advantages in terms of reduction of the vibro-acoustic disturbances perceived by the buildings located near the layout of the metropolitan lines, in 2020 a performance improvement plan, consisting of the migration of the vehicle recognition mode from the barcode reading system to the TAG-RFID system, was launched.

For the future, ATM is developing an action plan that sets the objective of acoustic remediation for four areas exposed to the noise of metro line M2. As a whole, the plan provides for sound mitigation by installing acoustic barriers along the route of noise propagation, to be developed over a 12-year period. The Municipality of Milano, which owns the infrastructure, in 2020 approved the project for the first intervention area referring to the M2 section along via Palmanova.

The main projects at a glance

During 2020, the following infrastructure maintenance activities, financed by the Municipality of Milan, were launched and/or continued:

- renovation of the tunnel between Piola and Lambrate (2nd phase) ;
- extraordinary upgrading of tram equipment (4th, 4th bis, 6th and 7th phases);
- T lines and fast lines - adaptation of tram stops and traffic light technologies of line 24;
- Supply and installation of platform stairlifts for the Milan metro;
- Redevelopment of M2 metro stations (Gessate branch);
- Extraordinary escalator maintenance (lots 11,12,13 and 14);
- Modernization of the underground data network power supply;
- Escalator replacement;
- Renewal of M2 metro line equipment.