

INTEGRATED CCTV-BASED TRAFFIC MANAGEMENT BY SEMARANG SMART CITY DURING THE COVID-19 PANDEMIC

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Abstract

The transportation sector became a necessary thing during the Plague. Uncontrolled transportation potentially creates higher Sars-Cov-2 virus transmission and impacts the logistic distribution. Semarang City integrated its Smart City technology as an effort to achieve the level 1 status of COVID-19. Thus, this study aims to analyze traffic management through the Smart City program Integrated CCTV during the COVID-19 in Semarang City. This research is descriptive qualitative research assisted by NVIVO 12 Plus data analysis software. The study results in several facts that occur in the field. The traffic management strategy during the COVID-19 is a form of inter-institution, private sector, and community integration. CCTV control has its limitation due to the uneven distribution of fiber optic. Thus, the stakeholders combine technological and conventional methods. Hence, they can still manage COVID-19 unpredictable situations.

Keywords: Integrated CCTV; Traffic Management; Semarang Smart City; COVID-19.

INTRODUCTION

The spread of COVID-19 occurred massively on three continents, namely America, Europe and Asia. The highest case in the Americas was the United States by confirmed cases. The outbreak was spread through community-level transmission. The first highest case in Europe is France, with 4,980,133 confirmed cases. The virus spreading was also through community-level transmission. Furthermore, the country with the highest positive rate in Asia is not China as the country of origin of the virus but India. India is the highest number of COVID-19 cases country in Asia with 13,527,717 confirmed cases or the second-highest in the world.

The pattern of outbreaks in India tends to be different than in other countries. It is divided into outbreak clusters according to the geographical conditions of the country. The death rate in Indonesia also tends to be high by 42,530 deaths or equivalent to 2,7 % of all cases (Gugus Tugas Percepatan Penanganan COVID-19, 2021). Indonesia became the 19th position as the country with the highest positive rate in the world. The transmission of the virus in Indonesia is similar to another country with the highest cases. It is virus transmission at the community level.

The Central Government imposed social restrictions under the supervision of the Regional COVID-19 Handling Task Force as a step to optimize the prevention and control of the spread of COVID-19 in areas with high positive case rates. The implementation of PSBB is guided by Government Regulation Number 21 of 2020. Large-Scale Social Restrictions are restrictions on certain activities of residents in an area infected with COVID-19 to prevent

the possibility of spreading the virus in the area. The implementation includes school and work policies. It also took restrictions on religious activities, public places, modes of transportation and other related activities. Strict policy supervision by involving the apparatus in its control at the regional level.

Semarang City is one of the cities that enforce social restriction based on the Regulation of the Mayor of Semarang City Number 28 of 2020. The scope of this regulation aims to prevent the spread through activity restrictions, increase spread development anticipation, improve health services quality, reduce negative characterization (stigma) for the survivors and reduce the impact caused by the economic, social and security sectors to maintain stability in the city of Semarang during the COVID-19 pandemic. However, the condition of Semarang City as the Capital of Central Java Province has become a migration magnet for the surrounding areas, which is a problem that must be faced by the Semarang City Government to reduce movement in and out of Semarang City. Therefore, the Semarang City Government highlighted the arrangement of the road network system with a series of traffic engineering. This policy is not only to prevent but also to maintain the distribution of the economy to stay awake during the pandemic.

During the pandemic, the City of Semarang has carried out a series of traffic engineering projects. In April 2020, the closure of protocol roads including Pandanaran Street (starting from Tugu Muda to Simpang Lima), Pemuda Street (from Paragon Mall to Tugu Muda), Gajah Mada Street (starting from Simpang Lima to Simpang Gendingan), Jalan Pahlawan (starting from Air Mancur to Simpang Lima), A. Yani Street (starting from Simpang RRI to Simpang Lima), Dr. Wahidin Street (from TL Kaliwiru Intersection to Sisingamangaraja Intersection), Lamper Tengah Raya Street (from Majapahit Intersection to Mrican Intersection) and Tanjung Street (starting from Imam Bonjol Intersection to Pemuda Junction). Road closures are also divided into semi-permanent closures and scheduled closures. Scheduled closing starts at 18.00-06.00 WIB.

The closure was also conducted before the turn of the new year in 2021. The closure is carried out permanently for 3 days from December 31, 2020, to January 2, 2021. The roads that are closed include Pemuda Street, Pandanaran Street, Gajah Mada Street, Pahlawan Street, Ahmad Yani Street, Tanjung Street, Wahidin Street, Lamper Tengah Raya Street and Letjen Suprpto Street in the Old Town area of Semarang. During the implementation of the Micro PPKM, the Semarang City Government closed nine roads, including Pemuda Street (direction to Paragon Mall to Tugu Muda), Letjen Suprpto Street (Old City area to Mberok Bridge), Pandanaran Street, Gajah Mada Street, Pahlawan Street, Ahmad Yani Street, Tanjung Street, Lamper Tengah Raya Street, and Supriyadi Street. The three roads, namely Tanjung Street, Lamper Tengah Raya Street, and Supriyadi Street, are closed for 24 hours. Meanwhile, other roads are only closed from 21.00-06.00 WIB every day.

In handling the traffic problem, the Semarang City Government uses the smart city program to create traffic governance in Semarang City integrated with related stakeholders. Smart cities are innovative efforts made by the city ecosystem to overcome various problems and improve the quality of life for humans and local communities (Hasibuan & Sulaiman,

2019). The initial stages of the Semarang Smart City began with the cyber government followed by cyber society. The Smart City concept is divided into 6S (Smart Governance, Smart Branding, Smart Economy, Smart Living, Smart Society and Smart Environment) and 4 Connection (Social Integration, Connectivity, Sustainability and Creativity). The implementation of Smart City is implemented on the website <http://smartcity.semarangkota.go.id/>. This program allows access to real-time data about the condition of the Semarang City.

The Smart Environment menu focuses on dealing with traffic issues. The Smart Environment contains the Main Road Map, Outage Map, Leger Road, Pedestrian Road, Drainage, Road, Irrigation, River, Transportation, Tower, One Map Semarang, and Smart Infrastructure. Meanwhile, access to road information can access the Semarang Smart Transportation City application. The application provides data access for ATCS, Smart Transit, Smart E-Keur, and Smart E-Report. This menu allows the public to see road conditions in Semarang through CCTV to estimate the density of roads and obstacles in a road segment.

Research related to social mobility restrictions supported by smart city-based traffic management becomes very important during a pandemic, especially for cities with inter-regional connecting transportation routes such as Semarang City. The radial area must be maintained as a critical route, but the circle line must also be maintained to prevent the spread of COVID-19. This traffic control and management also have implications for regional resilience so that the region also has the resilience to face all threats and challenges during the pandemic. The city of Semarang was chosen because of its status as the city with the highest number of cases in Central Java, namely 92,893 cases as well as one of the mobility activities of industry, services and government.

METHOD

This research is a qualitative descriptive study. Descriptive research can be used as a tool or method to examine data, such as human thought systems, phenomena that occur, and surrounding conditions. Descriptive qualitative research can be useful to explain the relationship between phenomena that occur and even explain the facts that are found and occur in the field. Descriptive research is intended to see and examine in depth the condition of phenomena and facts which will later be presented in the form of a research report (Arikunto, 2010). The reason the researcher took a qualitative descriptive study was so that the research conducted by the researcher could comprehensively describe traffic management in the Smart Environment program in the city of Semarang.

In the source and research data, the researcher divides into two consisting of primary data and secondary data. The method of obtaining the two sources is certainly different, both primary data and secondary data. Primary data is data obtained from the main sources obtained from interviews with informants related to research. Primary data is very important because it is the main data obtained directly from informants. The primary data of this research will be obtained through in-depth interviews with informants. The primary

sources in this research are the Semarang City Smart City, Polrestabes Semarang, Bappeda Kota Semarang, Dinkominfo Kota Semarang, Dinas PU Kota Semarang, Dishub Kota Semarang, and Distaru Kota Semarang.

While the secondary data in this study is a search for documents regarding the City of Semarang, besides that it is also obtained through documents regarding the smart city, Smart Environment, traffic management in the City of Semarang, and the resilience of the Semarang City area. Researchers use information obtained from any media, both books and journals, to obtain data on traffic management in the Smart Environment program of Semarang City. This research was also assisted by the NVIVO 12 Plus software to analyze existing problems (Auld et al., 2007). The features used in the NVIVO 12 Plus software use the crosstab feature. In this case, the crosstab feature is used by researchers to find problems in aspects of implementing the Smart Environment in Semarang City's traffic management during the COVID-19 pandemic. In the crosstab table will be shown the value of each is obtained.

RESULTS & DISCUSSION

1. Traffic Control Policy Strategy in Handling Covid-19 in Semarang City

The entry of the COVID-19 virus caused many problems. A Task Force for the Acceleration of Handling COVID-19 involving cross-agency integration was also formed (Djalante et al., 2020). There are several strategies for handling COVID-19, including vaccination, health policy (3M and 3T), and economic recovery (Atmajanti et al., 2020). Health care is supported by the implementation of health protocols in the community. The health protocol is based on the Decree of the Republic of Indonesia Minister of Health Number HK.01.07/MENKES/1591/2020. The main points of this protocol include washing hands, social distancing, and wearing masks (Pasaribu et al., 2021).

One part of the health protocol is social distancing. The minimum recommended distance is 1 meter. However, with Indonesia's condition, which is closely related to physical contact and face-to-face contact, it becomes a challenge in itself. To carry out efforts to alleviate the pandemic while simultaneously running the community's economy, various social restriction schemes were formulated. This policy transforms from time to time to adapt to the latest conditions. The first restriction policy starts with Large-Scale Social Restrictions (PSBB), Implementation of Restrictions on Community Activities (PPKM), Enforcement of Restrictions on Micro-Community Activities (PPKM Mikro), Enforcement of Restrictions on Community Activities (PPKM Darurat), and Level Enforcement of Restrictions on Community Activities (PPKM Level). The policy changes and their legal basis are shown in the following figure:

Table 1. Changes in Social Restriction Policies During the COVID-19 Pandemic

Policy	Year	Regulation
PSBB	2020	Permenkes No 9 Tahun 2020
PPKM	2020	Inmendagri No 1 Tahun 2021
PPKM Mikro	2021	Inmendagri No 3 Tahun 2021
PPKM Darurat	2021	Inmendagri No 15 Tahun 2021
PPKM Level 1-4	2021	Inmendagri Tahun 22 Tahun 2021

(Sources: Researcher Analysis Results, 2021)

Based on the dynamics of this social restriction policy, there is a pattern in which the decision-maker is not only centralized in the central government. The Regional Autonomy System implemented by Indonesia allows for continued implementation of policies at the provincial and regency/city levels. The basic principles of regional autonomy within the framework of the regional administrations' conceptions are delegation authority, the distribution of income (income sharing), power (discretion), diversity in unity (uniformity in unity), local self-reliance, and the development of local capacity (capacity building) (Imron, 2011). Therefore, the implementation of social restrictions is adjusted to the conditions of each region based on Regional Leadership Instructions.

The city that is quite adaptive to this policy is the city of Semarang. As the capital of Central Java Province, social restrictions become urgent with the high flow of migration to the city. The spatial pattern plan for the city of Semarang is a distribution plan for the allotment of subzones, which includes protected forest, zones that protect the zone below, local protection zones, housing, trade and services, offices, industry, and RTNH (Putra et al., 2015). This makes Semarang City a centre of gravity for the surrounding agglomeration areas. According to data from the City of Semarang on Corona Alert, 800 migrants have lived in Semarang City since April 1, 2021. 794 people were declared healthy and 6 others were sick. The arrival trend is dominated by private vehicles and stations. In addition, the migrants also take advantage of the air route to enter the Semarang city area. Semarang City, which had entered a critical phase on February 15, 2021, saw a spike in cases from 14,441 to 17,815 in a day. Social restrictions are increasingly being encouraged.

Figure 1. Pattern of Social Restrictions in Semarang City in 2020 – 2021



(Sources: siagacorona.semarangkota.go.id, 2021)

It is known that there have been 12 social restrictions since the first transmission of the COVID-19 virus reached Semarang City. There is an important point in this policy, which is to prevent crowds so that the transmission of the virus can be suppressed. Under the Semarang Mayor's Instruction Number 2 of 2021, the types of programs carried out in the context of limiting activities start from remote working, distance learning, implementation of health protocols in public facilities, and travel restrictions. While the influencing factors include: 1) restrictions on social, economic, religious, cultural, educational, and other activities; 2) mobility control; 3) controlled isolation plan; 4) fulfilment of basic needs; and 5) sanction enforcement (Muhyiddin, M., & Nugroho 2021).

The Semarang City mobility control policy is carried out by implementing traffic management. Integrated traffic management is also implemented to minimize mass movement. The traffic management in question is in the form of road closures, flow diversions, and insulation to the closure of freeway access. In its implementation, managers in the field of traffic in the city of Semarang itself are based on Government Regulation Number 37 of 2011 concerning the Traffic and Road Transport Forum. The purpose of the establishment of the Road Traffic and Transportation Forum is to serve as a vehicle for coordination between agencies to manage and solve traffic and road transport problems in urban agglomeration areas. Article 21 paragraph 1 also states that the membership at the regency/city level consists of the Regent/Mayor, Head of Police Department, State-Owned

Enterprise in the same area, associations of public transportation companies, representatives of universities, and NGOs. In the area of Semarang City itself, the Traffic and Road Transport Forum consists of inter-agency integration, including the Semarang Police, Semarang City Government, the Department of Transportation, and other supporting elements. The role of each stakeholder in traffic governance takes place dynamically, from planning to program monitoring.

Traffic policy planning in the city of Semarang begins with a discussion in the Forkopimcam (City-Scale) environment by involving the community, the village head, and the head of the community association (RT/RW) regarding environmental conditions in the community. This condition was then reported to the Semarang City Government to be discussed again at the Regional Leadership Communication Forum level. The proposals are then assessed for the fulfilment of the criteria. This process is carried out based on Government Regulation Number 37 of 2011 Article 12, which explains the working mechanism of the Road Traffic and Transportation Forum. If it meets the criteria, further coordination will be carried out related to the implementation of the field. In the situation of the COVID-19 pandemic, all Forkopimcam and local governments have set several road closure points, which are indicated to cause crowds. Semarang City Checkpoint locations based on potential crowds are divided into five categories, namely Culinary Areas, Old Town Areas, Simpang Lima Areas, Semarang City Toll Gates, and City Borders. The distribution of road closure points is explained by the following table:

Table 2. Semarang City Checkpoint

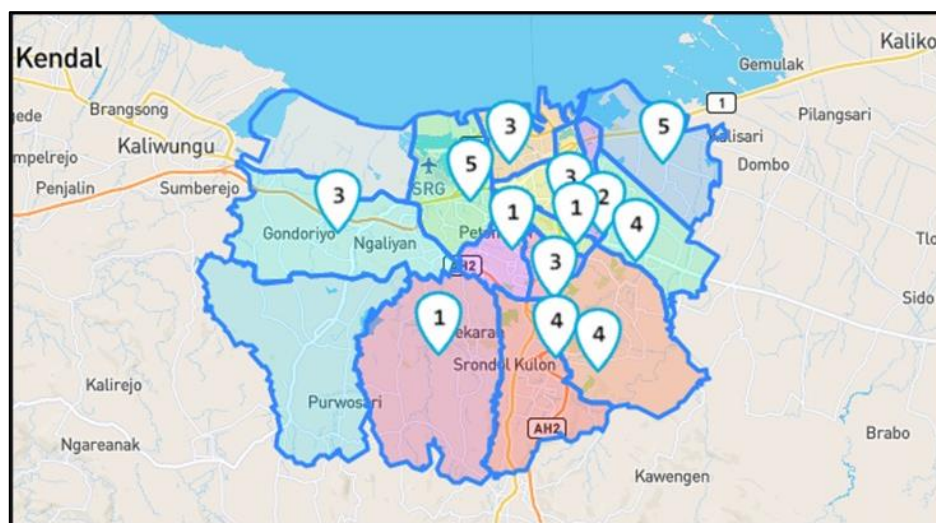
No	Street Name
Semarang Potential Crowd Area	
1	Ngesrep Timur Street (Diponegoro Statue)
2	Supriyadi Street
3	Lamper Tengah Raya Street
4	Sendangguwobaru Street
5	Srikaton / Honggowongso Street
6	BK – Suratmo Area
7	Pemuda Street
8	Gajah Street
9	Kranggan Toko Mas Street
10	Kauman (Perlengkapan ABRI) Street
11	Tanjung Street
12	Sampangan Street
13	Dr. Sutomo (Hotel Siliwangi) Street
14	Sugiyopranoto Street
Simpang Lima	
1	Pandanaran 1 dan Pandanaran 2

2	Pahlawan Fountain Circle Road
3	Airlangga (In front of Berlian)
4	Ahmad Yani Edge Road
5	RRI Edge Road
6	MH Thamrin (Fatima Zahra) Street
Kota Lama (Old Town)	
1	Cendrawasih Crossroad
2	Cendrawasih Edge Road

(Sources: Polrestabes Semarang, 2021)

These points can change dynamically according to the pandemic conditions in the area. If confirmed cases are high, road closures are possible. Conversely, if the case slopes, the road can be reopened. Road closures are also based on the recommendation of the local Forkopimcam. Based on the Covid-19 microzonation map, the red to orange areas are located in the southern part of Semarang City, including the Banyumanik, Tembalang, and Gunungpati Districts.

Figure 2. The Semarang City Covid-19 Microzonation Map



(Sources: siagacorona.semarangkota.go.id, 2021)

Based on the level of vulnerability of the case, each head at the sub-district level proposed additional road closures in each of his sub-districts. These points include Banyumanik District (2 points), Pedurungan District (2 points), Gadjahmungkur District (1 point), Tembalang District (1 point), Tugu District (2 points), Gunungpati District (2 points), North Semarang District (1 point), West Semarang District (2 points), South Semarang District (1 point), East Semarang District (2 points), Genuk District (3 points), Ngaliyan District (1 point), Candisari District (1 point) and Mijen District (2 points). In addition,

checkpoints are also placed at each border and the Semarang City toll gate. The goal is to not only monitor the entry and exit of migrants to Semarang City, but this checkpoint is also the location for testing Covid-19 specimens. If a person is detected as positive, they will immediately follow up regarding self-isolation and treatment.

The implementation of the traffic management program during the pandemic is carried out by agencies engaged in the technical field based on decisions from the Semarang City Traffic and Road Transport Forum. The technical services in managing traffic during the pandemic consist of the Semarang Polrestaes Satlantas, the Semarang City Department, and assistance from the TNI and Satpol PP. Prior to entering the field, the personnel had previously been selected by each agency in accordance with the needs of the field. The number of personnel deployed in traffic management during the Semarang City pandemic is as follows:

Table 3. PPKM Traffic Management Personnel in Semarang City

No	Asal Instansi	Jumlah Personel
1	Police	576
2	Army	217
3	Transportation Department	90
4	Community Special Police (Satpol PP)	60

(Sources: Polrestaes Semarang, 2021)

Program supervision is carried out vertically and horizontally. Horizontal program supervision is carried out by each agency by placing one employee as Supervision and Control Officer. This personnel's role is to act as a supervisor for ongoing traffic regulation as well as an evaluator of the activities performed. The Pawasdal position itself at each checkpoint is appointed in rotation so that all agencies have the same opportunity. The results of program supervision will then be followed up to formulate other related policies. Vertical supervision is carried out by each institution's supervisory agency. Within the scope of the National Police, the performance of the Semarang Polrestaes is assessed by the Regional Supervision Inspectorate of the Central Java Police. Army personnel were evaluated by the Diponegoro VI Military Regional Command Inspectorate. Meanwhile, in the process of monitoring the evaluation of the ATCS of the Semarang City Transportation Department, it was carried out by the Semarang City Regional Planning and Development Agency and the Semarang City Inspectorate.

2. Integrated CCTV Based Traffic Management by Semarang Smart City during the Covid-19 Pandemic

The management arrangement is guided by the RTRW Regional Regulation No. 4 of 2011 concerning the Spatial Planning of the City of Semarang for 2011–2031. The road

network in the City of Semarang is divided into 8 sections, namely Barrier-free, Primary Arterial (Outer Ring Road), Secondary Arterial (Middle Ring Road), Secondary Arterial (Inner Ring Road), Primary Collector, Secondary Collector, Primary Local, and Secondary Local (Dinas Tata Ruang Kota Semarang, 2021). With road closures in effect in the Inner and Middle Ring Road areas, mobility will experience a shift to nearby collector roads. Road conditions that sometimes do not match the ratio will cause traffic problems.

In dealing with these problems, the City of Semarang integrates management and supervision through the Semarang Smart City. The Ministry of Home Affairs of the Republic of Indonesia describes the Smart City concept as an integrated city planning concept with a broad development scope and combined with the development of information and communication technology with the aim of, among others, creating livable, advanced, and modern urban planning and development, increasing regional productivity and economic competitiveness and building the foundation of Indonesia's smart nation (Hasibuan & Sulaiman, 2019). The purpose of the smart city itself is to form a city that is comfortable, safe, and strengthens competitiveness in the economy.

The Smart City of Semarang City itself was designed under the Regulation of the Mayor of Semarang Number 26 of 2018 concerning the Semarang Smart City Master Plan. The smart city framework of Semarang City consists of three components: structure (HR), infrastructure (facility development), and superstructure (policy). Apart from being a smart environment, the smart city of Semarang also has other programs such as smart governance, smart branding, smart economy, smart living, and smart society. The presence of Smart City is designed to be a solution to public services in the city of Semarang. In the early stages of designing the Semarang Smart City, there was no element of pandemic prevention. However, along with the development of conditions, the Semarang City smart city dashboard now also accommodates services related to the handling of the COVID-19 pandemic.

Figure 3. Semarang "Smart City" Dashboard



(Sources: smartcity.semarangkota.go.id, 2021)

A smart city is not only about technology development. A smart city is a city that can produce solutions that can be said to be smart. It's the same with traffic regulation during a pandemic. Roads that are very vulnerable to being transmission locations are arranged in such a way as to be a solution during a pandemic. The movement of mass mobility due to road closures can also be controlled by utilizing integration through smart city programs, especially the smart environment. The smart environment consists of Public Street Lighting, Outage Map, Street Leger, Pedestrian Road, Drainage, Road, Irrigation, River, Transportation, Tower, One Map Semarang, and Smart Public Works Infrastructure. The integrative component of traffic management and the smart city of Semarang City is located in the Transportation menu.

Smart transportation has several integrated systems that can be used to support efforts to mitigate the COVID-19 disaster, starting with bus management, Tcash BRT, Moovit, and CCTV. The Bus menu makes it easier for us to see the willingness of the Semarang City Trans Rapid Bus as an alternative to overcome the road closures imposed during the pandemic. This bus menu is supported by a Moovit menu that displays your position with the nearest bus stop and BRT. To prevent direct contact, Tcash BRT is also applied (limited to transit stops).

Figure 4. CCTV Integration in Semarang City



(Sources: <http://cctv.semarangkota.go.id/integrasi/osm>, 2021)

CCTV in Semarang City has now been integrated through <http://cctv.semarangkota.go.id/integration/osm>. There are 10 types of CCTV that have been integrated, including OPD, Regions, ATCS, Region, TPS/TPA, Market, Public Service, Pump House, and Provider. In this integration, there are 10,517 CCTVs. Most of the CCTV has been equipped with an analytical system. Each technology owner service has the authority to carry out supervision. However, the Office of Communication, Information, Statistics, and Encoding has also integrated it into one integrative room under the supervision of the Mayor, namely the Semarang Situation Room.

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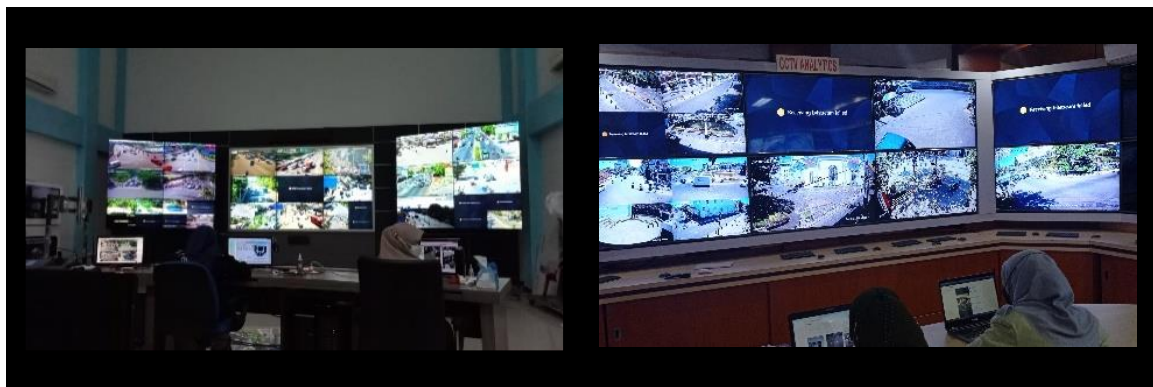
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The Situation Room is located in the Semarang Mayor's Building, Jalan Pemuda, South Semarang. In terms of regulating mobility, which is closely related to transportation, this authority is under the control of the Semarang City Transportation Service. Traffic CCTV is controlled through the ATCS Semarang command centre. ATCS-Area Traffic Control System Semarang City has a traffic control system that aligns red light times on the highway network from a city intersection. Traffic regulation through this system requires the parameters of the number of vehicles and vehicle travel time. ATCS is used in flow control using a traffic signalling device / Alat Pemberi Sinyal Lalu Lintas (APILL) connected to the ATCS application.

The number of APILL that have been integrated with ATCS is 53, spread across the city of Semarang. Of the total, 52 APILLs are integrated with the Semarang City Integrative CCTV. Then, 33 of them have been equipped with an analytical system. In addition, two CCTVs are equipped with radio sensors so that they can carry out traffic control automatically. These two CCTV sensors are placed in Puri Anjasmoro, West Semarang. The location of the two APILL with this sensor is in an area with less heavy traffic because there is only a maximum of 40 seconds per phase. Therefore, determining the mass of the vehicle is not as complicated as on a busy highway.

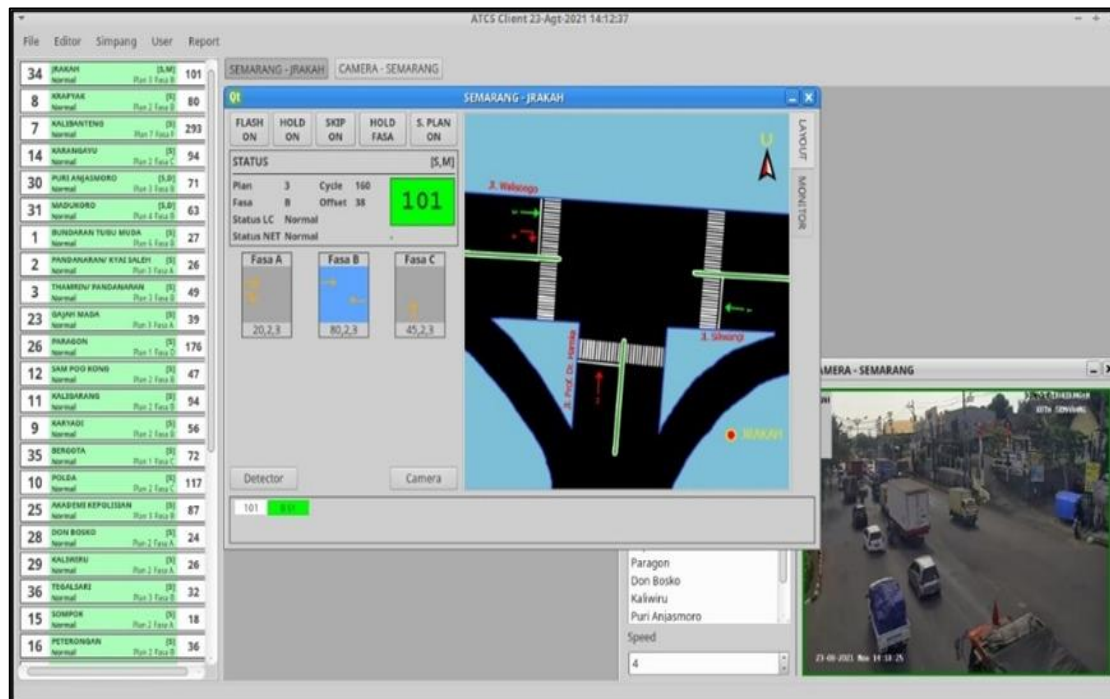
Figure 5. Semarang City CCTV Control Room



(Sources: Research Documentation, 2021)

The ATCS application can set the phase length of each intersection until the current draws. Through this application, traffic management can be done. If there is a light density, the operator will do the remote control at the command centre. CCTV ATCS surveillance lasts for 16 hours. Supervision is divided into two shifts that coordinate with other agencies related to traffic regulation. Based on CCTV real-time data, if there is a traffic problem, ATCS will immediately coordinate with the National Police to take part in handling the problem.



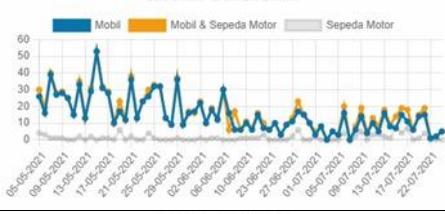







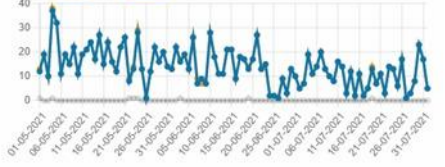
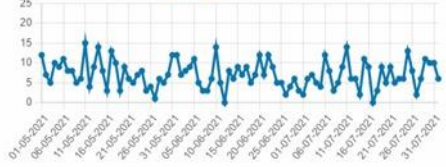
Figure 6. ATCS Application Display

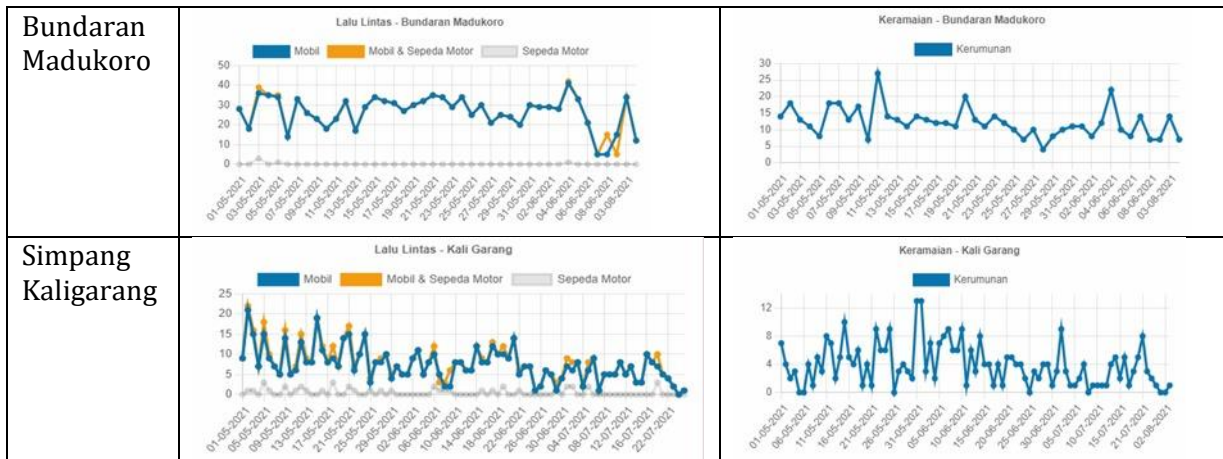


(Sources: Dinas Perhubungan Kota Semarang, 2021)

The type of CCTV used in the ATCS system originally used analogue CCTV, so it is more difficult to operate. Now, analogue CCTV is only used in a few locations. The CCTV system with a DVR is equipped with a high-capacity external hard drive so that the captured image resolution is clear. These locations are locations that have not yet been reached by fibre optic networks, such as the Kota Lama and North Semarang areas. Meanwhile, the West to East Semarang area uses CCTV with Hikvision's PTZ camera. With this camera, ATCS officers can conduct 360° surveillance. However, now CCTV ATCS has been equipped with artificial intelligence. Artificial Intelligence Due to budget refocusing and tender constraints, this program has been designed since 2020, but it will only be implemented in March 2021. With CCTV Analytics, monitoring is not only done manually by the user but there is also by supporting analytical data. The data below is an analytical result of several analytical-based ARCS CCTV samples where road closures and checkpoints are carried out. The sample data starts in July as the first month of delta cases. Then the data limit was raised in June as the deadline for data availability and the road closure policy in Semarang City began to be lowered. This timeframe is used to obtain crowd dynamics and traffic density on closed roads. Alternative roads are also explained as a comparison.

Table 4. ATCS CCTV Analytical Data

Street	Traffic Density	Health Protocol
Road Closure		
Kaliwiru		
Lamper - Gajah		
Tugu Muda		
Masjid Kauman		
Tol Gayam Sari		
Alternative Road		
Akademi Kepolisian		



(Sources: Researcher Analysis Results, 2021)

Based on the data above, it is known that there is a decrease in vehicles at the locations of road closures. In contrast to alternative roads that tend to be stable. Even under conditions of social restrictions, changing lanes from a closed road to an alternative route creates crowds. The results of this analysis can be used as a reference for the Semarang City COVID-19 Handling Acceleration Task Force in formulating changes to road closure policies if they cause a problem. However, limited data availability due to network limitations makes analytical data difficult to obtain.

Semarang City's fibre optic network is embedded in both the west and east areas. It is much different from the conditions in the north and south. The northern part of Semarang City is a port area and on the North Coast route, so it has geographical conditions that are prone to robbery. It's the same with the southern region; the hilly contours of the land make it difficult for vendors to install networks. The demolition of bricks, which requires a lot of funds, is also an obstacle to upgrading to analytical CCTV in the Old City area. With the obstacles that occur, the traffic and mobility management officers also tend to use a combination of conventional and technological arrangements. This is to overcome traffic problems such as congestion that cannot be controlled by the system. Smart cities are a solution for city resilience, but with field practice. Semarang A smart city is an integrative entity between technology and society itself.

CONCLUSION

Based on the results of the previous discussion, it can be concluded that the traffic management strategy during the COVID-19 pandemic is a form of integration between agencies. This integration and its implementation have been regulated in the Government Regulation concerning the Road Traffic and Transportation Forum. Both the determination of the point and the placement of the checkpoint are mutual agreements based on the consideration of current conditions. Each agency also assists in providing personnel according to their respective authorities. Policy implementation takes place with vertical and

horizontal supervision. Sector agencies such as the Department of Transportation, Polri, Diskominfo, and others have their respective roles at each stage of the implementation of traffic governance. Traffic monitoring and regulation using CCTV ATCS are experiencing dynamics where there is a decrease in traffic and an increase in traffic. So, officers in the Command Center Room must be more alert if there is a current density that triggers a crowd. Then, with network limitations, analytic CCTV integrated with ATCS has not been comprehensive. The detection feature for the use of masks has also not been implemented because the resolution of the camera used is at the middle level. These limitations give rise to collaboration between technology and conventional practice. In breaking down the crowd and enforcing health protocols, it is back to the authority of field personnel such as the National Police. To overcome the existing but not perfect system, an in-depth study of the field conditions both in terms of data and observation is needed to create the right policy formulation. The problem of transportation is not a simple matter. Traffic delays will also have an impact on other sectors.

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