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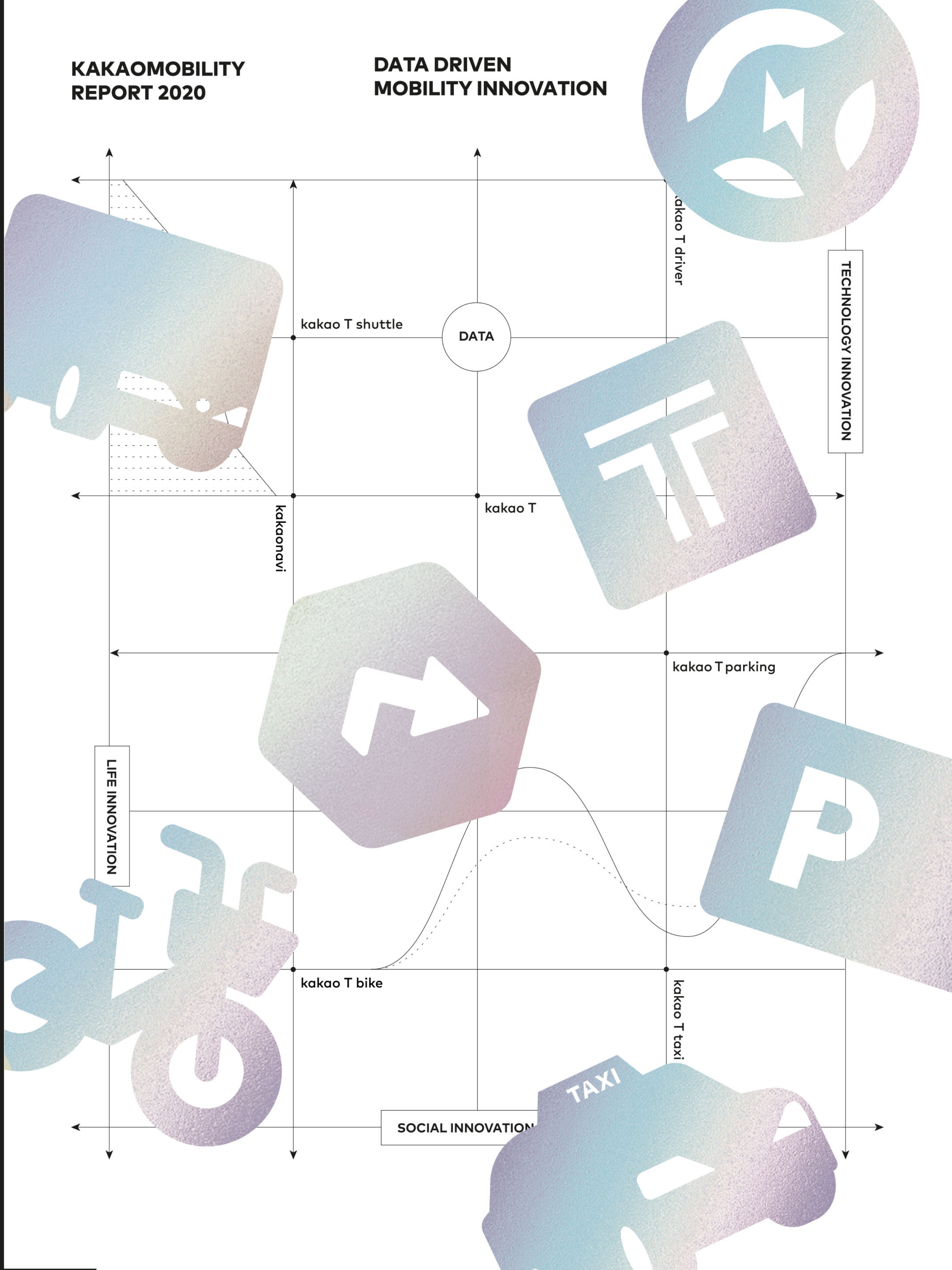
KAKAOMOBILITY
REPORT 2020

DATA DRIVEN
MOBILITY INNOVATION


akao T driver
TECHNOLOGY INNOVATION
kakao T shuttle
DATA
kakaonavi
kakao T
kakao T parking
LIFE INNOVATION
kakao T bike
kakao T taxi
SOCIAL INNOVATION
TAXI

KAKAOMOBILITY
REPORT 2020

we move everyone's life smarter and faster.

kakaoT
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kakao T bike

CEO's Message

kakaomobility report 2020 marks the fourth annual issue of the series first appeared in 2017. Since its first launch in March 2015, Kakao T Taxi has expanded its service scope to Kakao T Blue with franchise taxis, Kakao T Black with luxury taxis, Kakao T Venti with van taxis and more to meet different mobility demands. This taxi-hailing service was incorporated into a single mobile app called Kakao T along with its diverse mobility services like Driver, Navi, Parking, Bike and Shuttle. Data accumulated via its mobility services has laid a foundation for mobility innovation. This report analyzes such data in various aspects and provides an insight into mobility.

COVID-19 has spread around the world in 2020, accelerating global changes. Some said, "People have experienced a two-year digital shift for only two months." Amid this changing world, data would be definitely one of the most important resources. New consumption and working patterns based on digital technologies require the use of data. Its importance cannot be understated in the mobility field.

kakaomobility report 2020 features "data-driven mobility innovation" that Kakao Mobility Corp. has focused on so far. We have recruited data professionals with a wide range of experiences and have established state-of-the-art data infrastructure even before the coronavirus outbreak. In order to connect data to mobility innovation, we have created a data driven decision making culture. We have made an effort to cover every step of the process how data has been used for our innovative mobility services in this report. I expect this report to help pave the way for the era of the digital shift that has been accelerated.

Gungseon Ryu
CEO of Kakao Mobility Corp.

About kakaomobility report 2020

This report consists of four chapters with a topic of data driven mobility innovation. It covered mobility innovation from the perspective of mobility data based on technology, society and life and featured mobility changes made by COVID-19 that is this year's biggest issue.

First of all, Chapter 1 Technology Innovation reviewed the meaning of data collected by Kakao Mobility and how it collects and uses data to achieve mobility innovation. As part of Kakao Mobility's technological achievements, structural changes in the taxi market, FIN technologies on Navi and demand estimation systems and AI suggested fares on Driver were introduced.

Chapter 2 Social Innovation addressed Kakao Mobility's research and effort to create social values using mobility data. It also included how Kakao T Taxi has relieved the inconveniences of existing taxis and how Kakao Mobility has found solutions to urban parking problems with Seoul Digital Foundation and suggested late night shuttle lines for designated drivers.

In addition, how people use services as the society changes based on data was analyzed. In cooperation with the Korea Transportation Safety Authority, how the Safe Speed 5030 campaign has affected a driver's habit was examined based on mobility data. How the newly introduced 52-hour workweek has an impact on drinking culture was analyzed. Besides, how domestic mobility services will be able to grow in the future by comparing the taxi market in Seoul and New York was observed.

Chapter 3 Life Innovation reviewed how Kakao Mobility services have changed our daily lives. This chapter introduced how Kakao T Bike launched as a last mile transportation has been used in reality and what kind of features Kakao T Parking, Shuttle, Business have provided. It also took a close look at our daily lives based on the footprints of mobility left on mobility data.

Finally, COVID-19 Special Section covered mobility life changes before and after the coronavirus outbreak. Changes in mobility patterns and use of navigation and taxi services were examined. In cooperation with the Korea Tourism Organization, new travel trends were analyzed and safe, untact travel destinations were selected. In the untact era, features provided as personalized services by Kakao T and different campaigns and activities for the safety of users were introduced.
Kakao Mobility has continued to examine social meanings and values of mobility data since the first issue of kakaomobility report 2017 in the hope that such data will be widely used and its values will be added. Hopefully, this report will help prepare for mobility changes to be made in the future.

kakaomobility report 2020
writers

KAKAO MOBILITY'S KEY SERVICES

Kakao T Taxi

Nov. 2015	Luxury taxi service Kakao T Black launched
Apr. 2018	AI-based matching service Smart Call launched
Mar. 2019	Franchise taxi service Kakao T Blue launched
Dec. 2019	Large-sized taxi service Kakao T Venti launched
Jun. 2020	Deluxe taxi call service reformed

Many people have been using Kakao T Taxi in their daily lives and have shown more different expectations toward mobility for the last five years. In order to meet their expectations, Kakao Mobility has continuously expanded services. In addition, for the purpose of providing user-centered services, Kakao Mobility has not only connected taxis and passengers but also have made an effort to enhance taxi service quality.

When COVID-19 spread this year, Kakao Mobility actively encouraged automatic payment service to minimize face-to-face interactions. Kakao T Blue with franchise taxis took preventive measures against the coronavirus so that users can have a safe ride in a virus-free taxi. In addition, Kakao Mobility launched a “Distancing in daily life” campaign for drivers and users even on the go.

Kakao Mobility is making efforts to improve the career values of taxi drivers. It also helps operate their business more effectively, enhance their income and improve their working environment by applying different passenger-driver matching processes.

Kakao T Taxi has enhanced service quality by expanding its service and combining high technologies, and at the same time has expanded its position in people’s mobility by taxi with consideration for users’ safety. On top of this, it will lead the way to help improve drivers’ working environment so that they can drive taxis safely.

Kakaonavi

Jan. 2018	Korea's first Expressway Emergency Alert Service
Jul. 2018	Kakaonavi becomes the only supported navigation app on Google Android Auto
Sep. 2018	2018 Kakaonavi supported on Apple CarPlay
Nov. 2019	"U+Kakaonavi" launched with LG U Plus
Apr. 2020	LTE based accurate indoor positioning technology "FIN" adopted

Kakaonavi is a smartphone based navigation service launched in February 2016. It has shown continuous growth, becoming the top navigation service in the country with 180 million navigation guides per month.

Based on a huge amount of data collected from Kakaonavi users and other Kakao T service users including Taxi and Drive, Kakaonavi analyzes traffic flow for 24 hours and provides fast and exact navigation guide minute by minute. In addition, it supports different platforms including Android Auto and Apple CarPlay and provides a better user experience through continuous service improvement.

Kakaonavi is making efforts to reflect different user demands by introducing 3D maps, adding a fuel type for an electric car and reforming driving UIs and to continuously update its services to provide smart navigation services. In particular, it developed LTE based indoor positioning technology "FIN (Fused Indoor LocalizationN)" first in the world and applied it to Kakaonavi. By doing so, it has introduced innovative technologies that help get accurate directions even in a tunnel where GPS signals do not reach.

In addition to the navigation service, Kakaonavi is making efforts to make innovation happen. It has provided information on COVID-19 testing centers and drug stores with face masks and has been developing a navigation service only for ambulances for rapid and safe patient transfers. Kakaonavi will continuously do its best to help navigation technologies contribute to our society.

Kakao T Driver

Nov. 2018	Pro service with call based driver services launched
Jul. 2019	Designated driver service with no refusal of passengers, supporter driver recruited
Nov. 2019	Demand estimation system for designated drivers and AI based fare suggestion
Jun. 2020	Kakao T Driver Point Call for Busan and Ulsan launched
Aug. 2020	Kakao T Driver Premium launched

Kakao T Driver is a designated driver service app launched in May 2016. With a few taps on the smartphone, Kakao T Driver connects a designated driver and a user easily and rapidly. It recorded 44 million rides completed for about four years, becoming a must app for a designated driver service.

Kakao T Driver has rapidly grown by successfully differentiating itself from the existing call based services with its simple call process, rapid matching and easy automatic payment. Since the app automatically finds and shows a user's location or allows a user to save his favorite destinations, users can save time on the app. It also suggests the best fare for a user based on AI technologies, helping match users and drivers rapidly. When matching is done, the driver's picture, name and insurance information are provided, and a user can send "on-board" messages to his or her friend or family on the move for the safety of the user.

For a customer who wants a differentiated experience, the luxury service "Kakao T Driver Premium" was launched later this year. This kind of service has been provided mostly for corporate customers so far, but is available for anyone on the app. Kakao Mobility will continuously expand service scope to meet diverse demands of users and help diversify the designated driving market and increase access points of users.

As public awareness of DUI rises, enforcement and punishment levels are getting stronger. This has increased a demand for a designated driving service. Kakao T Driver is fully committed to helping all Korean users go back home quickly and safely.

Kakao T Parking

Nov. 2018	Automatic payment feature available after entrance launched
Dec. 2019	Kakao T Parking control solution lanunced
Mar. 2020	Kakao T non-affiliated parking lot search feature launched
Apr. 2020	Parking service agreement for the COEX complex signed
Jul. 2020	"IT parking system" applied to Everland

Kakao T Parking launched its services with the release of a consolidated mobility platform Kakao T app in October 2017. Kakao T Parking has been in partnership with the owners of private parking business and operators of public parking business owned by local governments in key areas in Seoul and Gyeonggi and is continuously expanding its service scope.

Kakao T Parking applied ICT to the parking business and realized the vision of "Smart parking" that "shares" and "connects" parking spaces. This means that Kakao T Parking is making continuous efforts to connect the beginning and end of mobility.

Its users get directions to a parking lot through Kakaonavi on the app, check availability on a real-time basis and book one of the affiliated parking lots in advance. In addition, its automatic payment service allows payment on the mobile device. For non-affiliated parking lots, it provides service hours, parking fees, pictures and more information that users want.

Due to a sharp rise in coronavirus cases this year, more people drove their own car, increasing parking demands, and more users who prefer untact payment used automatic payment.

This year, Kakao T Parking is gaining ground in the parking market with a parking control solution called TCP(T connected Parking). If TCP is built in more parking lots, more parking related data would be collected, helping Kakao T Parking create diverse mobility prediction data.

Besides, Kakao T Parking has run large-sized parking businesses like Everland and Young City and has piled up its know-how. Based on this, Kakao T Parking will continue to play a leading role in the parking industry.

다음에 또 만나요!
주차가 필요할 땐, 카카오T주차
다음에 또 만나요

Kakao T Bike

Mar. 2019	Kakao T Bike trial service launched in Seongnam, Gyeonggi and Yeonsu-gu, Incheon
Jul. 2019	Service launched in Jeonju, Jeonbuk
Sep. 2019	Service launched in Ulsan
Aug. 2020	Service launched in Seo-gu, Incheon and Songpa-gu, Seoul
Sep. 2020	Service launched in Hanam and Ansan, Gyeonggi

Kakao T Bike launched its trial service with about 1,000 bikes in Seongnam, Gyeonggi and Yeonsu, Incheon in March 2019. People have increased needs for personal means of transportation to travel a short to medium distance where it is hard to travel by car or taxi with lack of access to public transportation. For this reason, Kakao T Bike has been loved by many users since its launch. It also introduced a service in Jeonju in July 2019 and Ulsan in September 2019 and has expanded its service into more regions.

Kakao T Bike uses electric bikes with PAS (Pedal Assist System) where a user pedals along with the electric motor, helping go faster and easily bike up a hill with less energy. In addition, since there are no bike rental shops or bike stations for Kakao T Bike, any users can rent or return a bike where a service is available.

Kakao Friends characters loved by almost all Koreans like Ryan, Apeach, Muzi, Tube and Jay-G are riding in a bike basket. Kakao Friends characters add fun to a bike ride during leisure or commuting time.

Kakao T Bike is working to make its service available with upgraded bike models in more different regions this year. It will apply stronger mandatory insurance coverage so that users can enjoy a safe ride. It has a dedicated maintenance team for battery charge, repair and relocation working for 24 hours, so that any issues can be handled rapidly.

SEONGNAM CITY

Kakao T Business

Feb. 2018	Kakao T Biz Taxi launched
Dec. 2018	Kakao T Biz Black launched
Mar. 2019	Kakao T Biz Driver launched
Apr. 2020	Kakao T Biz Navi and Kakao T Plus launched
Sep. 2020	Business Home launched

Kakao T Business is a corporate membership service that helps make all mobility of workers easy. It started a service with Biz Taxi in February 2018, followed by Plus, Biz Driver, Biz Navi, Biz Black and more. It is creating a smarter business mobility culture with more than 6,000 partners.

Kakao T Business makes the best use of the Kakao T app to help corporations relieve workload of general affairs teams, make executives and employees work more easily and save operating expenses for business travel. It provides budget management systems and transparent ride history reports for general affairs team's easier management of staff and budget. It provides a rapid and comfortable ride and a wallet-free automatic payment service for executives and employees. Companies can set different call conditions according to their policies so that they do not have to check the ride criteria of executives and employees separately. They also benefit from reduced congestion charges.

In addition, Kakao T Business opened "Business Home" on the Kakao T app this year to provide more convenient mobility services like Taxi, Driver and Navi altogether for workers. With Business Home, managers, marketers, sales representatives or the self-employed can use and manage all business travel services of Kakao T in a centralized space.

Kakao T Business will make more effort to carefully meet the needs of everyone who needs business travel including executives and employees and provide a better

Kakao T Shuttle

Jun. 2019	Kakao T Shuttle Beta launched
Jun. 2019	Shuttle provided for Ultra Music Festival Korea 2019
Oct. 2019	Shuttle provided for 16th Jarasum Jazz Festival
Nov. 2019	Shuttle provided for Melon Music Award (MMA) 2019
Jan. 2020	Shuttle provided for New Year's sunrise and winter festivals
Aug. 2020	Kakao T Shuttle officially launched

Kakao T Shuttle is Kakao Mobility's shuttle service that provides shuttles for anyone so that they can go to their destination easily. It successfully started its trial service with Ultra Music Festival Korea in June 2019, Jarasum Jazz Festival, Melon Music Award, New Year's sunrise, winter festivals and other events and officially launched its service in August 2020.

Kakao T Shuttle is designed to provide services for users that need shuttles at a reasonable price so that they can travel easily. It only provides new model vehicles where preventive measures against COVID-19 are completed and provides mandatory training courses for drivers. By doing so, Kakao T Shuttle is making efforts to offer its differentiated services. In addition, users do not have to ask for quotations from different shuttle providers for comparison. If a user enters necessary conditions, Kakao T Shuttle immediately presents quotations and checks shuttle schedules.

People rarely charter a bus and ride it in their life. However, Kakao T Shuttle wants to make such a short moment easy and pleasant. As Kakao T Taxi has moved existing call based services or a way of taxi hailing on the road into the smartphone, Kakao T Shuttle will make an effort to make inconvenient processes of chartering a bus simple and easy.

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CHAPTER 1

TECHNOLOGY INNOVATION

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TECHNOLOGY INNOVATION

/

Kakao Mobility Data A to Z

It’s the data era

We are living in the era of data. The National Assembly of the Republic of Korea passed the “Data 3 Act” in January 2020. In the Digital New Deal announced by the government on July 15, 2020, data related policies including a so-called “data dam” emerged as a key issue. As COVID-19 has accelerated digital shifts, interest in data has exploded among individuals and businesses. Data has already been part of our daily lives. If mobile services like a taxi calling service, mobile shopping, and a delivery app stop only for a few hours, we could easily find news articles that cover users’ complaints about the inconvenience. This means that data influences everything in our lives. These mobile services are closely related to data.

Data makes the impossible possible and is the driving force for an easier and more comfortable life. Under the banner of mobility innovation, Kakao Mobility is creating a new mobility experience based on data.

Without data, Kakao Mobility also could not have published this annual report series that has been issued since 2017.

Paradox of the data era

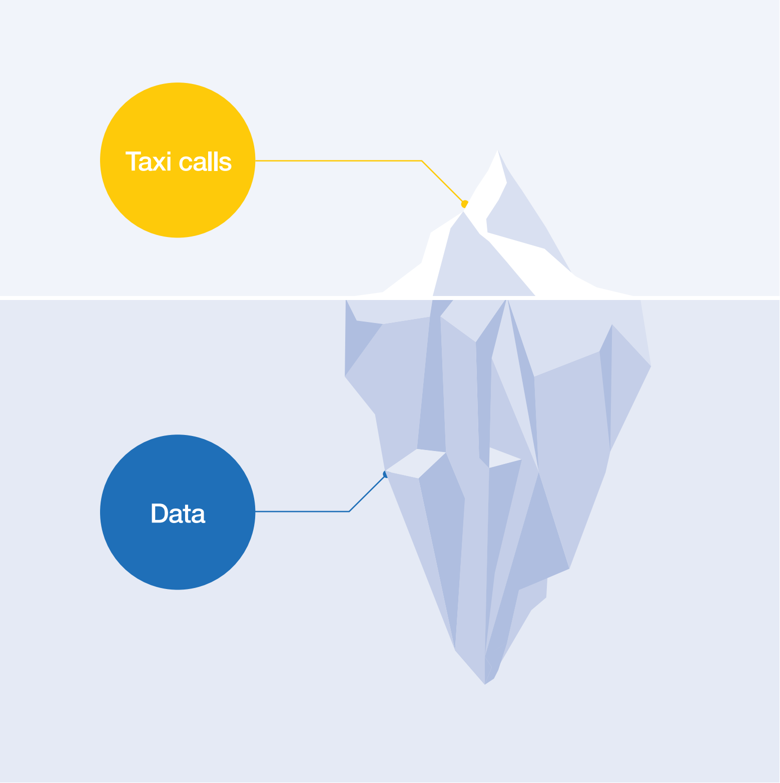
Data is still new to many people. While data has influenced our daily lives and has emerged as a key issue, many people do not know how data is created and used. This is probably because they cannot see or touch data. However, the main reason is because customers rarely experience data in person even if they use data driven services.

Data hides on the other side of services. As science fiction grand master Arthur C. Clarke said, “Any sufficiently advanced technology is indistinguishable from magic.” Data driven innovative services are provided to customers. In this process, advanced data infrastructure, skilled workforce, data driven decision making culture and more are supported. However, what we actually see are results, that is services, instead of relevant processes.

Its characteristics may lead to misunderstanding sometimes. One of the examples is a taxi hailing app. Many people who have already gotten used to calling a taxi on the phone wonder what is the special difference with calling a taxi on the app. They may think the only difference is that people are using a mobile app instead of a phone to call a taxi.

However, there is a big difference between a call taxi and a taxi-hailing app. Like the tip of the iceberg, enormous data power is on the other side of such an app service. Once a call taxi service is done, relevant data evaporates into nothing. On the other hand, taxi app data is collected and such data is actively used for service improvement. The potential of data driven innovation grows over time, which can lead to mobility innovation. Kakao Mobility started with Kakao T Taxi and has grown into a leading company of mobility innovation. In this process, the importance of data cannot be understated. Next, we will closely review how data makes a change.

The Tip of the Iceberg



How data driven mobility innovation works

'We move everyone's life smarter and faster'

Kakao Mobility was established to provide a service that makes mobility faster and smarter. In this process, the innovation leader is working to keep innovation moving. There is data driven decision making at the center of its efforts. Data driven decision making means making a comprehensive decision on where, how and what type of services will be provided, on a basis of data.

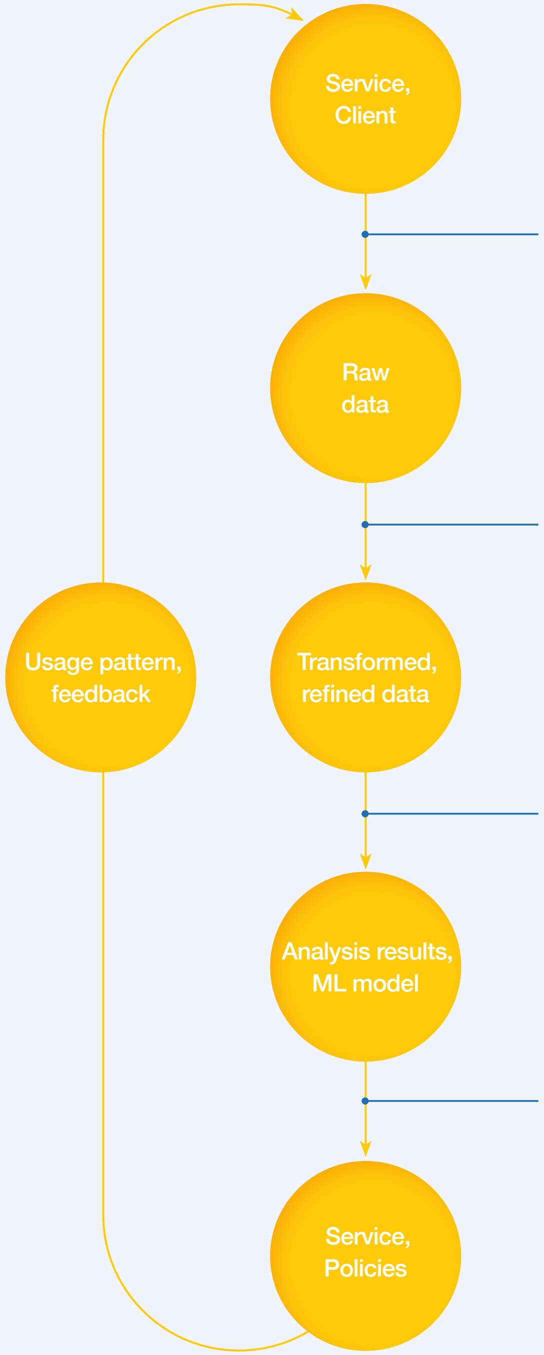
There are different ways to plan and manage innovative services. Intuition and inspiration obtained from long time experiences in the market are one of them. When data is not collected, people's experiences are key resources of innovation. Recently, data has been added to people's experiences. Data provides a chance to support subjective judgement and decision based on objective facts. It is common that Silicon Valley based IT companies and leading companies that make the digital shift use data in their decision making process. Likewise, Kakao Mobility uses mobility data, ratings and other data collected in the process of providing services in its decision making and service operation. Data is at the center of mobility innovation that Kakao Mobility pursues.

Kakao Mobility's data driven decision making

As the old saying goes, “Nothing is complete unless you put it in final shape.” Data is not useful unless it is not used. In order to make a better decision and provide better services, an ability to collect, transform and analyze data is essential. Technical skills supported closely by soft skills like ways of working and organizational culture help make a decision. How does Kakao Mobility make a data-driven decision?

Kakao Mobility has increased investment and efforts to secure technical skills for data driven decision making. The following figure shows how data driven decision making and service operation work at Kakao Mobility. This displays how data from Kakao Mobility services is collected, processed and analyzed and data engineers collaborate until a decision is made.

Data driven decision making and service operation system



Backend engineer

- Service operation
- Raw data collection and transfer

Data engineer

- Data ETL(Extract, Transform and Load)
- Large data process and management

Data analyst, scientist and ML modeler

- Application of methodology like statistics and network analysis
- Key index management
- Delivering data-driven insights
- ML model creation

Service Development Team

- Policy making
- Service operation and decision reflection

Backend engineer for building an automated data collecting system

A backend engineer collects data. Data is generated 24/7 via Kakao Mobility services from Taxi, Driver, Bike, Parking to Navi. Each backend engineer by service establishes a stable server to keep services running, and at the same time builds a system that automates data collection so that such a huge amount of data is kept safe and can be a driving force for innovation.

Backend engineer Flo

A backend engineer is a developer that develops services and takes responsibility for service stability and expandability. Besides, they verify different technologies including effective data management, error monitoring and log management and then apply them to services to make higher quality services. .

Data engineer for refining and reprocessing data

A data engineer processes data collected by a backend engineer. They refine and convert such raw data via ETL (Extract, Transform and Load) so that team members can use.

Data engineer Curry

A data engineer is responsible for managing the flow of a huge amount of mobility data from all Kakao Mobility services and loading it properly. They design and operate a large and real time distributed processing system that reprocesses and provides data to enhance the quality of mobility.

Data analyst and data scientist help use data in the decision making process

Different data professionals like a data analyst, a data scientist and an ML (Machine Learning) modeler use refined data for decision making. They add values to data through various data analysis methods including statistics, data mining and machine learning. Their output is used to develop and operate services and support strategic decision making for the management level. Improved or newly released services in this process generate new data which is used in the process of collection, refinement and analysis to create new value.

Data scientist Dominic

A data scientist produces a valuable result from enormous data via different methodologies like machine learning, statistics and network analysis.

Such data is widely applied to services provided by Kakao Mobility. For example, machine learning models produced through enormous data learning have been used for key features on mobility platforms like dispatch, pricing, and speed prediction. A machine learning model has been applied to a dispatch system of Kakao T Taxi so that a driver is matched with a user who wants to go to a driver's' favorite regions. Another example is an AI suggested fare system introduced to help more users move to their destination. A model that estimates travel time to destination on Kakaonavi is also based on machine learning.

Data analysis Lia

A data analyst collects dispersed data and studies and tests it with different hypotheses. They also widely analyze data from different services and provide a consulting service for data driven decision making processes and successful business.

Development tools and infrastructure play another important role in data driven innovation

More investment in development tools and infrastructure is being made to maintain data driven innovation. For example, above mentioned machine learning based features should be constantly updated for better performance. Internally established model learning and distribution platforms maximize the efficiency of such tasks.

In addition, many computer equipment and servers are required to perform lots of calculations that process enormous data like ETL and machine learning models. Kakao Mobility has constantly made investments in equipment to provide more stable services, and at the same time its engineers have enhanced the efficiency of service operation by introducing different technologies that process data in an effective way.

Many tools have been used for analysis based on statistics and data mining. Memory based database Impala was applied for rapid response to queries regarding large data, and responsive data analysis tools like Zeppelin and Jupyter Notebook have been adopted to perform more efficient data analysis for reusing and sharing. In order to visualize time and space data, Kakao Mobility has developed new tools or modified existing tools so that they can be used for its own services. Besides, Kakao Mobility has made diverse efforts to apply rapidly changing technologies to its business and has achieved results. Relevant efforts and results are shared via "if Kakao Developer Conference" prepared by Kakao community developers.

The data age has come everywhere, but data does not come to sight. It seems that the Solow Paradox in the 1980s is back: "You can see the computer age everywhere but in the productivity statistics." Data is on the other side of services used by consumers based on corporate infrastructure, personnel and culture, making an individual's daily life easier and a better society.

Kakao Mobility has introduced services for mobility innovation based on data driven decision making that is barely noticeable. Kakao Mobility will continue to build technical capabilities for data driven mobility innovation. This will help Kakao Mobility stand shoulder to shoulder with global mobility leaders.

Power of mobility data

Kakao Mobility uses diverse data for mobility innovation. Ratings provided by different users on mobility platforms, payment data created from its automatic payment service and data from other internet services have been widely used in Kakao Mobility. Among them, mobility data coming from Kakao Mobility services is one of the most important sources of its distinguished value.

Mobility comes where human beings act

Lots of data help identify and analyze human beings' actions. However, mobility data attracts more attention due to the importance of mobility. Mobility requires time and costs, but people move constantly. Lockdown cities due to COVID-19 first remind people of empty streets or uncrowded buses. Likewise, our daily lives without mobility is only possible under unusual situations. Whether it is part of daily life like commuting or getting out of the routine like going on a trip, people constantly move and show themselves. The following table shows different data types that help analyze people's life. They are highly valuable because they help identify where people actually move and have interest. Since they can be automatically collected, the amount is huge and can be immediately analyzed. In this sense, these types of data are especially valuable.

Characteristics of mobility data and non-mobility data

	Data	Advantages	Disadvantages
Non-mobility data	Financial payment data	Identifying exact actions	Not figuring out travel route and non-payment actions
	Search data	Identifying interest and predicting actions	Not identifying if actions are real or not
Mobility data	Smartphone location data	Constantly identifying accurate locations	Hardly figuring out users' destinations or actions
	Public transit data	Identifying exact travel route and time	Not figuring out actions and final destinations
	Mobility data from mobility services	Identifying travel route and time and actions including non-payment actions	Having time of not in use

Mobility data vs. financial and search data

Most data related to life patterns is financial data and search data. Financial data helps identify exact actions of users, and search data helps rapidly identify interest of users. Nonetheless, a user's actions with no payment made or with no actual move and travel route cannot be identified based on these two types of data. For these limitations, it is hard to fully figure out life patterns of users only with these types of data.

On the other hand, mobility data provides insight into daily lives of users and social changes through mobility records of many users. Smartphone location data helps constantly identify travel history, and public transit data is used for different decision making processes because it is easy to collect such data. However, these two types of data have common disadvantages of hardly specifying where users actually visited. In particular, since there are many places in a single building, it is not easy to figure out where users visited simply based on location data.

Information from internet search is qualitatively different from information from actual visit

Data from mobility services can supplement such limitations somehow. This type of data shows departure and destination points and routes. This helps identify the purpose of travel and information about locations where no payment is made. As transportation modes that users used can be identified along with route information, smart mobility services where different transportation modes are incorporated can also be provided.

Kakao Mobility data has additional advantages. First of all, it provides detailed information about each point of interest (POI). Kakao Mobility has constantly managed POI data along with its map app Kakao Map and more services. For this reason, it is possible to identify the purpose of travel more accurately. More than 10 million users are a big plus. If the amount of good quality data is not enough to cover the entire group, its reliability would definitely fall. In this sense, Kakao Mobility has nothing to worry about. In addition, Kakao Mobility data is being converted into an analyzable form based on high quality data-related technologies, so different professionals can analyze data quickly.

Kakao Mobility data has power to discover the lives of users and social changes by identifying when, why and where users gather. Whether or not users actually travel or why can be identified and this differentiates Kakao Mobility data from other mobility data or non-mobility data. Restaurant information gained from internet search is qualitatively different from information based on actual visit.

Kakao Mobility enhances its service quality based on its enormous high-quality mobility data so that users can experience mobility innovation. kakaomobility report 2020 took a close look at technology innovation, social innovation and life innovation based on data and technologies.

TECHNOLOGY INNOVATION

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Mobility innovation driven by mobility technology

Taxi meets data, creating a new riding experience

Data has been making a change in the taxi market that has been under regulations for a long time. It is since mobility platforms were added to a taxi that connected dots. As systems and technologies have interacted, the taxi market is starting its new history. Kakao T Taxi is working harder to add technologies to mobility to keep up with mobility innovation that has emerged in the world.

Taxi is a historic product of technologies and systems. The word "taxi" came from the modern taxi meter invented by German Wilhelm Bruhn in 1891. The first mechanical device was slowly replaced with the 1980s electric meters, but the methods that measure distance with wheel rotation continue to this day. Recently, with technical advances, GPS based app meters are spreading. While technologies played a major role in the birth of taxis, over 100-year history of the taxi market is significantly attributable to systems. Taxi quantity control, regulations on fares and service qualities and other systematic intervention have stopped the taxi market from collapsing. The government has managed taxi service quality by controlling taxi fares, managing a taxi driver's license and enforcing a taxi driver's refusal of a passenger. These regulations have prevented the failure of the taxi market.

The taxi market is the Market of Lemons and a thin market

What was the problem in the taxi market and what kind of systematic support was required? Above all, it is hard to know the quality of taxi service in advance. This is called experience goods. Once a ride is done, a user can rate service quality. A user who gets into a random taxi is always exposed to the uncertainty of service quality.

This kind of market in the presence of information asymmetry between providers and users is called the Market for Lemons. This comes from the well-known article of George Akerlof, the winner of the 2001 Nobel Prize in Economics. In this kind of market, good quality services disappear and bad services are more likely to remain. Therefore, in some cases, the government may intervene in the market. So far, the government has strictly controlled taximeters and fares and has actively intervened to maintain taxi service quality through a system of reporting an unkind driver. This aims to protect customers against a taxi driver's overcharging, unkind services and more.

The taxi market is a thin market as well, that is a market with few buying or selling offers. Supply and demand is hardly matched in this market. In general, buyers and sellers gather at a single place to make a deal. In the taxi market, however, they can gather at one place. It is hard to find a counterpart and negotiate prices in this market. A taxi demand is dispersed geographically depending on the location of users. Supply and demand was able to be matched only when a taxi driver picks up a passenger while getting around on the street. Even for call based services, a call center employee can handle a limited number of calls a day. In this market, a taxi driver's years of experience is important to look for a user who is distributed thinly and widely.

Excess supply in this market could worsen service quality and therefore, the market may collapse. If a taxi demand does not rise as much as increased supply, a driver may try to choose a passenger that wants to go to a more profitable region or route or continuously work too hard. As a result, customers would avoid poor service quality, possibly making excess supply worse and causing a vicious circle. Traditionally, the government has limited the number of licenses issued to taxi drivers to prevent excess supply. In addition, it has determined taxi fares in advance considering that price negotiation is difficult in the taxi market.

As mobility platforms emerged, technologies supplemented systematic limitations

With the emergence of mobility platforms in 2010s, a new paradigm develops in the taxi market. Instead of regulations, technologies started to supplement the limitations in the taxi market, meeting new demand and boosting market growth potential. The taxi market broke existing systems and started to be recognized as a new market of mobility.

Based on data, mobility platforms change the nature of the taxi market that has required systematic supplementation. Above all, service review data changes the nature of experience goods. In the past, all users could do was to report unpleasant experiences caused by unkind taxi drivers to relevant agencies. Still, many users were not able to complain and endured their unpleasant experiences from a taxi ride.

However, if such review data is collected, it can be a different story. Ratings and reviews based on experiences of users help improve service quality of a taxi, that is experience goods. If data is collected, users can distinguish between kind drivers and poor drivers causing unpleasant experiences. As how often and how bad a driver causes unpleasant experiences for a user can be analyzed, this can lead to actual service improvement including retraining of or sanctions on relevant drivers. In addition, geographically and physically limited supply and demand matching can be supplemented in the online space, turning a thin market into a thick market.

Different fare systems including a flexible fare system can be introduced and therefore, this can create a condition where diverse services can compete. How Kakao T Taxi is changing the taxi market structure based on data is reviewed more closely in the next page.

Kakao T Taxi changes the market structure with data

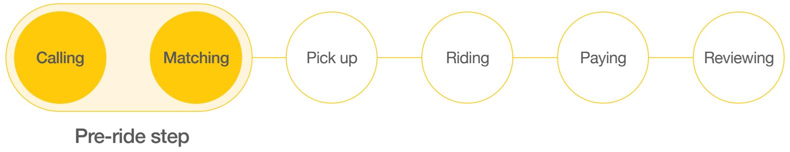
Kakao T Taxi shows how data is changing the taxi market. Every process including when a user calls a taxi and gets off a taxi, data is being used. These processes consist of calling, matching, pick up, riding, paying and reviewing and can be classified into three steps: pre-ride, during a ride and post-ride. Technological advance is at the center of all steps.

Technical advance and data usage based on Kakao T Taxi riding steps

Steps	Processes	Technology based innovation	Data usage
Pre-ride	**Calling**	Different services based on analysis of the needs of users	Estimated fares, available taxi data and more
	Matching	AI based matching algorithm	Evaluation of a driver, a driver's matching acceptance rate, a driver's operation pattern, taxi supply-demand ratio, real time traffic conditions, recent operation distribution, ETA(Estimated Time of Arrival) and more
During a ride	**Pick up**	GPS based identification of a user's location and destination and confirmation of a driver's profile	Location data of a user and a driver, data of a driver and a vehicle(name, picture, vehicle info, location and contract, etc.), travel time, distance, road info and more
	Riding	Identification of recommended routes and app meter based fares	Traffic info, real time location data, fare info(base rate, hourly rate, rate by distance, rate based on time and distance traveled, surcharge) and more
Post-ride	**Paying**	Automatic payment and different fare systems	User verification data, payment medium data and more
	Reviewing	Evaluation of service quality and review of users	Travel route, kind tag data and more

Diversified calling options for users

In the pre-ride step, a user calls a taxi and is matched with a taxi. When a user calls a taxi, he can select one of different taxi services. As of August 2020, general call, smart call, deluxe taxi call franchise taxi (Kakao T Blue) call, luxury taxi call (Kakao T Black), spacious high-occupancy vehicle (Kakao T Venti) call was included.



In order to meet the needs of users under diverse situations, their experiences should be first analyzed and improved. Kakao Mobility service planning team members are using data and different user experience testing methods including User Testing (UT), Focus Group Interview (FGI) and Customer Journey Map. Based on this analysis, vehicles, matching methods, fares and other detailed options are provided for users so that they can have more choices and better service experiences.

AI based matching that changes a thin market into a thick market

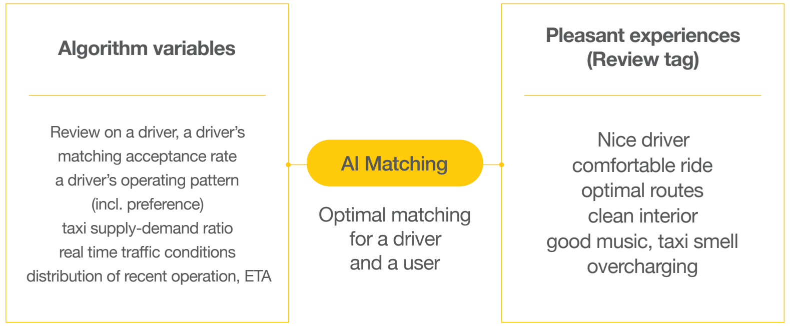
Once a user calls a taxi, AI based matching algorithms work. The matching algorithm analyzes different and enormous data on a real time basis for optimal matching between a user and a taxi driver. Basically, it figures out the estimated time of arrival (ETA) which is the time when a taxi is expected to pick up a user. A taxi located within a radius where a driver can arrive fastest would be a candidate to be matched with a user. Distance is not the only factor to be considered. If a taxi is a little bit far from a passenger, but can arrive fastest based on different data like real time traffic conditions, this taxi would be matched. For a user's perspective, the closest taxi means a taxi that can save his time the most, not a taxi physically located the closest to a user.

Location of a driver and a user is not the only factor considered in the matching process. Quantitative data regarding a driver is also analyzed in the matching algorithm. A user's review about a driver, a driver's matching acceptance rate, a driver's operating pattern, distribution of recent operations and more number of cases are included in this analysis. This is only to match a driver with a higher success rate but also to match a nicer driver if there are several drivers within the same radius because service quality is also important. Besides, the taxi supply-demand ratio is also used for optimal matching. This helps give a user a pleasant experience, simply not the fastest service.

It is safe to say that a matching system is the centerpiece of mobility platforms. Matching techniques that make both a driver and a user happy with matching among millions of calls a day cannot be learned overnight. Endless technology advance should be supported.

A sophisticated matching system successfully turns the taxi market from a thin market where a driver searches for a passenger on the road to a thick market based on platforms. The more the taxi market improves, the more users can ride a taxi. A driver is more likely to meet a user as well. It would be impossible if someone processes millions of calls to match a driver and a user one by one. This success is attributable to an AI based matching system.

AI based matching algorithm overview

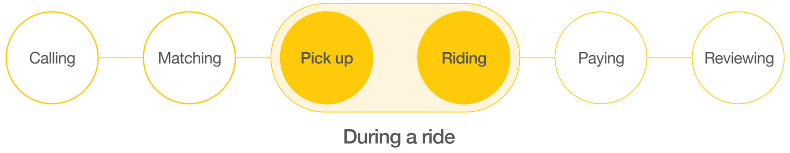

Algorithm variables
Review on a driver, a driver's matching acceptance rate
a driver's operating pattern (incl. preference)
taxi supply-demand ratio
real time traffic conditions
distribution of recent operation, ETA
AI Matching
Optimal matching for a driver and a user
Pleasant experiences (Review tag)
Nice driver
comfortable ride
optimal routes
clean interior
good music, taxi smell
overcharging

Positioning technologies make pickup and riding easy

Once a driver and a user are successfully matched, pickup and riding follow. Pickup is the process where a driver moves to where a user is, and riding is the process where a taxi moves from a departure point to a destination point. In these processes, in order for a user and a driver to meet at a pickup place, technologies of figuring out their locations and calculating recommended routes should be supported. This lets a user know an estimated fare and saves the trouble of explaining a route to his destination. A driver does not have to put time and energy to find a user's pickup point and destination as well.

GPS based positioning technologies used in the processes of pickup and riding are also used for fare calculation which is one of the most important factors in taxi services. Taxi fare calculation has been done by an electric meter that was upgraded from a mechanical type, but now it is replaced with a GPS based app meter.

Kakao T Blue introduced an app meter to a mid sized taxi on July 24, 2020, for the first time in Korea. Kakao Mobility's app meter obtained temporary permission from the Ministry of Science and ICT through a regulation sandbox in September 2019 and passed a temporary testing criteria this July provided by the Ministry of Land, Infrastructure and Transport, for the first time in the industry. With an app meter, tolls or out-of-town surcharges are automatically calculated and different plans like a flexible plan or a pre-fixed plan can be applied. A user can confirm the fare on his own smartphone app on a real time basis, instead of a meter mounted in the dashboard, and experience a new ride.

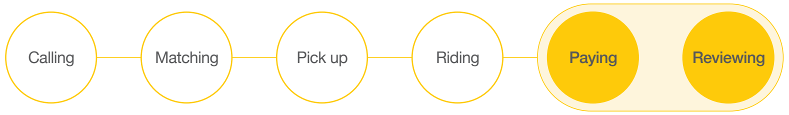


Easily pay and carefully review

Once a taxi safely arrives at a destination, paying and reviewing processes follow. It was common to pay by cash or credit card, but automatic payment is available on Kakao T Taxi. Once payment is made, a user can confirm a departure, a destination, travel time, operation info, taxi info, fare and more. For this reason, a user can use Kakao T Taxi safely. As untact consumption becomes important due to COVID-19, Kakao T Taxi has seen a sharp increase in this automatic payment service usage.

The final step of Kakao T Taxi is mutual reviews by a user and a driver. Like a delivery app, mobile shopping and other internet services, ratings and review provided by users play a key role in taxi service improvement. In particular, since taxi services are experience goods, review data is very important. This helps users guess service quality levels and therefore, the uncertainty that users have endured can be significantly low. Information asymmetry in the taxi market can be considerably alleviated.

Accumulated review data is reflected in matching algorithms, affecting taxi service quality improvement. In the past, a driver's refusal of a passenger, unkindness, reckless driving and more have been managed by irregular enforcement or a user's reporting. Now such behaviors are managed efficiently based on data. The overall quality level of the taxi market is expected to grow. Review data is also used for service related training of drivers.



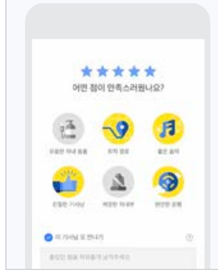
Post-ride step

Is taxi service quality evaluation possible based on review data?

Like many other services, Kakao T Taxi thinks about what kind of service a user likes. Since there are so many taxi users and drivers, users are more likely to judge taxi service quality subjectively. In order to maintain and manage service quality for more users, objective review is required. That's why Kakao T Taxi uses data.

Kakao T Taxi applied advanced evaluation systems for drivers in May 2020. Under the existing system, a user can provide a rating for services. Under the reformed system, however, a user can provide a rating and at the same time select multiple tags as soon as he gets on a taxi. For only six to seven months since the reform, almost 7 million ratings and tags were collected.

Reformed Kakao T Taxi User's Review



Reformed user's review
Aimed to make the review process easier

Reviewing on the ride

- Select multiple tags with a star rating
- "See this driver again" feature added (available when '5 stars' is selected)
- Send a push notification to encourage a user to write a review

Good taxi services are….

Data collected from the reformed review system shows what kind of services a user expects. Above all, users who rated Kakao T Taxi services as 5 stars selected the following top five tags: "Nice driver (31%)," "Comfortable riding (24%)," "Optimal routes (20%)," "Clean interior (17%)" and "Good music (6%)". This means users expect "A nice driver will drive a clean taxi with good music and provide a comfortable ride by selecting optimal routes." On the other hand, those who were unhappy with the services showed opposite tags. Those who rated as one star selected the following top five tags: "A driver's service (25%)," "Travel routes (15%)," "Driving habits (14%), "Unnecessary talking (11%)" and "Overcharge (7%)". These tags are opposite to the tags selected by the top rating providers. The following driver was found to make a user unhappy: "An unkind driver with a bad driving habit unnecessarily talks to a passenger instead of good music and overcharges by selecting his favorite routes."

As shown, data makes it possible to have a deeper understanding of what kind of services a user wants. This helps create an environment where good taxi services drive bad services out of the market.

Tag ranks by star rating

Rank	1-star rating	2-star rating	3-star rating	4-star rating	5-star rating
1	A driver's service 25%	A driver's service 25%	Driving habits 24%	Travel routes 25%	Nice driver 31%
2	Travel routes 15%	Driving habits 23%	A driver's service 22%	Driving habits 22%	Comfortable riding 24%
3	Driving habits 14%	Travel routes 18%	Travel routes 18%	A driver's service 20%	Optimal routes 20%
4	Unnecessary talking 11%	Unnecessary talking 10%	Cleanness/Smell 13%	Cleanness/Smell 13%	Clean interior 17%
5	Overcharge 7%	Cleanness/Smell 8%	Unnecessary talking 9%	No Unnecessarytalking 10%	Good music 6%

• Tag ranks by star rating I Based on data from June to July 2020

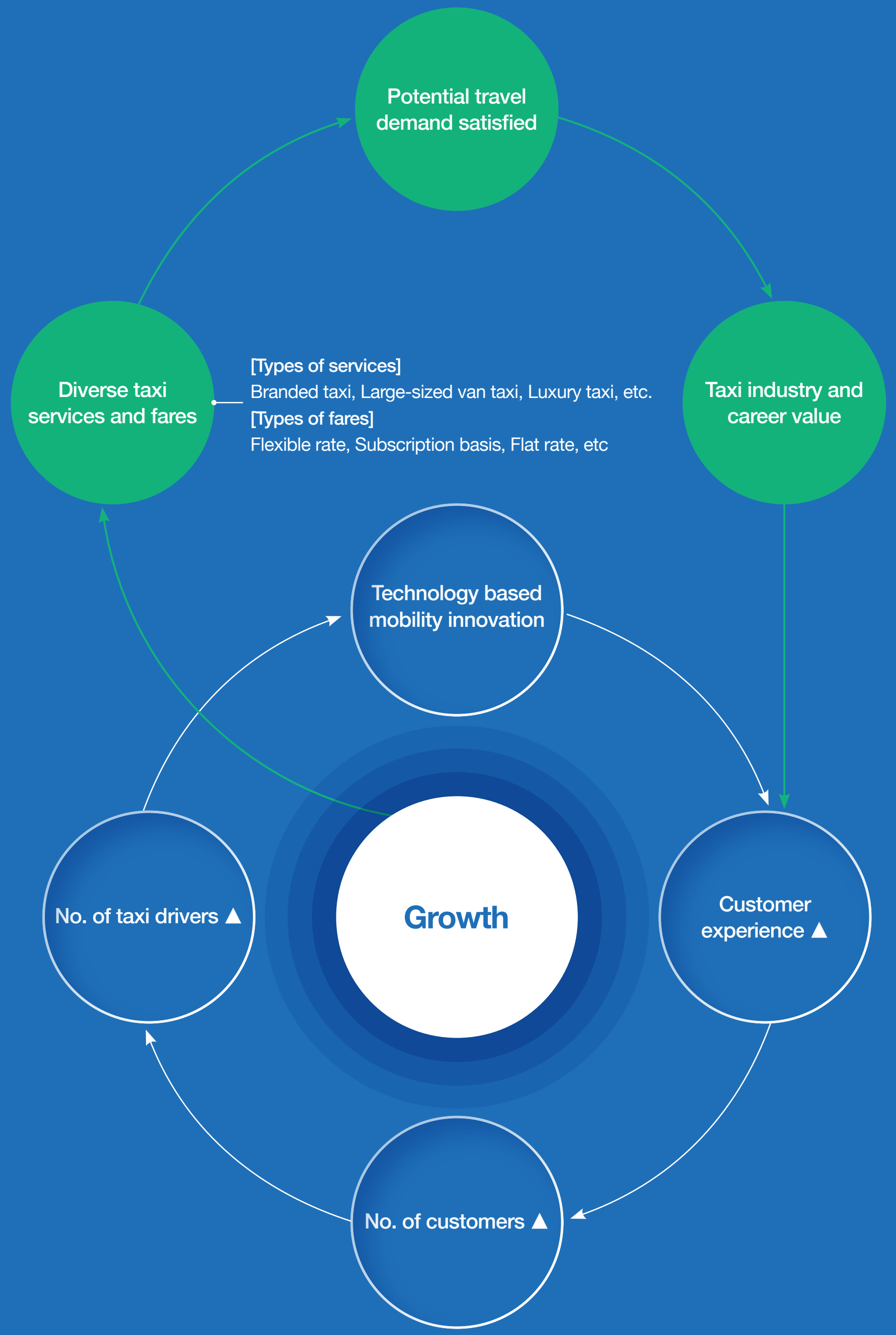
Kakao T Taxi creates a virtuous circle

The domestic taxi market has been caught in a vicious circle gradually with the development of transportation. Taxis already accounted for more than 18% of the entire transportation in Seoul in the mid-1980s, followed by subway (15.6% as of 1985) and cars (13.2%). However, more transportation methods replace taxis with an increase in private car users and improved public transportation systems. Under this situation, its share has gradually dropped for the last thirty years, reaching 6.3% in 2018. Taxi business environments have been worse, making taxi drivers' working conditions worse and taxi operation rate lower. Despite supply shortage, repeated problems like a driver's unkindness, refusal of a passenger and reckless driving have continued, causing users to avoid taxis. This vicious circle has repeated.

The taxi market caught in a vicious circle could not afford to accept new innovation. Traditionally, car sharing has played a role of traveling from one place to another in a city like a taxi, leading to mobility innovation in the world. Mobility platform based MaaS (Mobility as a Service) has emerged as a solution for urban traffic issues including traffic congestion caused by more private car users. However, they have hardly worked properly in Korea.

Kakao T Taxi is making different efforts to turn a vicious circle into a virtuous circle in the taxi market. It started to provide more options for users by making different taxi services based on technologies. Kakao T Taxi believes that as users experience differentiated services, those who avoided taxis will return to the taxi market. As the market grows, good quality jobs will be created and more skilled drivers will enter into the market, leading to a virtuous circle. As the Passenger Transport Service Act was revised with a regulatory framework for passenger vehicle platform service in March 2020, repeated conflicts and legal obstacles in the taxi industry were eased, laying a foundation for innovation in the taxi market.

Kakao T Taxi's vicious circle for quantitative and qualitative growth


● Technology based quantitative growth
🟢 Technology and service based qualitative growth
Potential travel demand satisfied
Diverse taxi services and fares
[Types of services]
Branded taxi, Large-sized van taxi, Luxury taxi, etc.
[Types of fares]
Flexible rate, Subscription basis, Flat rate, etc
Taxi industry and career value
Technology based mobility innovation
No. of taxi drivers ▲
Growth
Customer experience ▲
No. of customers ▲

Kakao dreams of becoming like Starbucks

Kakao T Blue is a branded taxi born to create a virtuous circle rapidly. Kakao T Taxi took the first step to make taxi services that taxi riders can trust as customers feel easy to drink Starbucks coffee anywhere. If Starbucks coffee varied vastly in flavors and service levels at its stores worldwide, the world's largest coffeehouse chain would hardly exist today. Likewise, a branded taxi exists to be a mobility service provider that taxi users can trust.

Kakao T Blue has made various attempts to provide differentiated and high quality services. It cannot change the taxi ecosystem with long established practices all at once. However, when a user calls a taxi, automatic matching is processed so that he does not have to worry about a driver's refusal. Kakao T Blue played a leading role by introducing a monthly pay schedule for its taxi drivers to resolve issues of corporate taxi drivers' sharing their daily earnings with their company. Kakao T Blue is making a step forward to make a change in the taxi industry.

One of Kakao T Blue's most significant attempts is improvement of service quality using data. Kakao T Blue assesses each driver's ratings based on cumulative review data of users on a monthly basis. Using this data, it is constantly monitoring service quality of each driver, which is used to improve service quality of the branded taxi drivers. This data is used to provide a reward for drivers who provided services that made users happy. Data of unhappy users is used to provide feedback for service improvement. As the voice of users can be reflected directly to service quality, inconveniences that existing taxi users endured is expected to be resolved.

In fact, a review system is common on online platforms. Kakao T Taxi has constantly collected review data. However, there were limitations on reflecting review data provided by users to service quality of drivers. As an intermediation platform, Kakao T Taxi have had difficulties in being involved in service quality of individual taxi service providers. A branded taxi can change this structure. It has an incentive structure that prevents franchises from having a negative impact on its brand value for its survival. A branded taxi is not only expected to contribute to a virtuous circle in the market, but also to cause a "catfish effect" in the long stagnant taxi market. Once a virtuous circle is established in the taxi market, the market will grow more. Citizen's attention will come back to taxis, instead of private cars or other public transportation means, causing potential demand for taxis to enter into the taxi market.

Once it grows the pie, conditions for improving working conditions of drivers can be created and good quality jobs can be added. Kakao T Blue will continue to make service innovation based on data to become a brand trusted by users and create a virtuous circle in the market.

How does Kakaonavi know my location even inside a tunnel?

Navigation is common. Still, some users often get lost inside a tunnel. It is because they cannot receive GPS signals inside a tunnel. Some tunnels are connected right to a junction at their end and others have speed limits inside. When a user just follows a route on a navigation app, he might miss a junction at the end of the tunnel or be caught for speeding in the tunnel.

Example of a junction connected right after a tunnel (Bongcheon Tunnel on Gangnam Beltway to Suseo)

FIN technologies help get accurate directions even in the tunnel

Kakaonavi found a solution from LTE signals of smartphones used by almost all people in the country. LTE signals are available even where GPS signals do not reach. LTE signals reach almost everywhere like inside a tunnel or a building or underground. Since LTE signals are not designed for positioning, however, they alone do not provide direction services. Additional technologies are required to use LTE signals for positioning.

LTE based indoor positioning technologies applied to Kakaonavi is "FIN (Fused Indoor localizatioN)". This is a technology that makes it possible to compare and analyze LTE signal patterns to find an exact location. It establishes a database for LTE signals and compares and analyzes LTE signal patterns of a user's smartphone to track the location. On the contrary, existing navigation services use estimated values based on travel time inside a tunnel with no GPS signals. Kakaonavi provides accurate direction services by figuring out a user's "actual" location inside a tunnel.

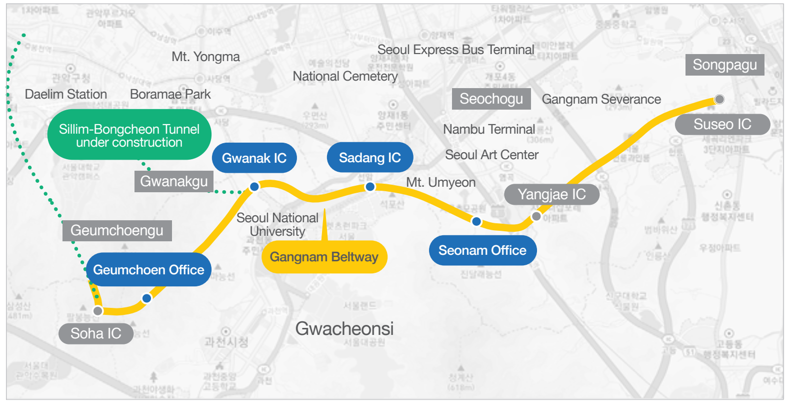
• Source: Kakao Map

The first trial service in three tunnels on Gangnam Beltway

Kakaonavi launched FIN-based trial services in three tunnels (Gwanak Tunnel, Bongcheon Tunnel and Seocho Tunnel) on Gangnam Beltway in April 2020. Nearly half of the entire section of Gangnam Beltway (approximately 11 kilometers) consists of tunnels. Demand of users for getting directions inside a tunnel is high because some tunnels are connected right to a junction at their end. A driver should take an accurate lane inside a tunnel in advance. If he fails, he should make a detour of more than 10 kilometers. This is very common.

With FIN technologies, most drivers who take Gangnam Beltway do not have to feel nervous and inconvenient at a junction anymore. As a result of analyzing Kakaonavi data before and after FIN, “re-routed” cases dropped by 10%. Considering that over 70,000 vehicles a day take this road on average, over 2 millions off-route cases are expected to be prevented. If more than 10-kilometer detouring cases in the off-route event is also considered, the economic value of time and fuel saved with FiN is incalculable. FIN technologies do not require any other devices but a smartphone.This is because a smartphone uses the strength value of signals exchanged from the base stations for data communication. Since a smartphone uses LTE signals like GPS, additional expenses for signal usage are not required as well. With low expenses for improved positioning, enormous social values can be created.

Gangnam Beltway Map

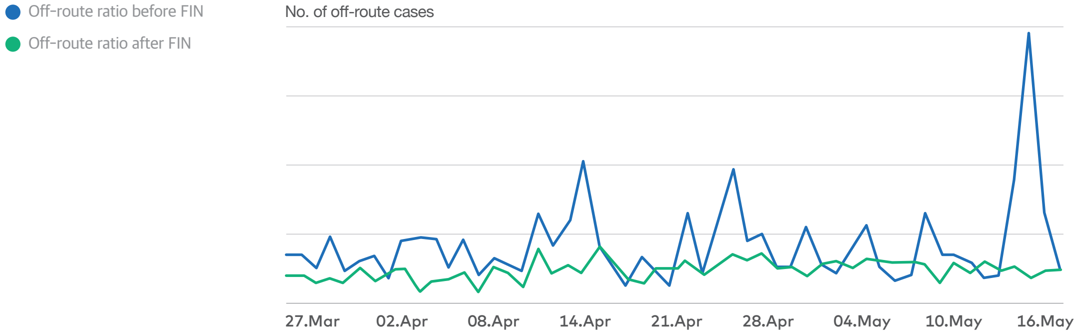

Mt. Yongma
Seoul Express Bus Terminal
National Cemetery
Songpagu
Daelim Station
Boramae Park
Seochogu
Gangnam Severance
Sillim-Bongcheon Tunnel under construction
Suseo IC
Nambu Terminal
Gwanak IC
Sadang IC
Seoul Art Center
Gwanakgu
Mt. Umyeon
Yangjae IC
Seoul National University
Geumchoengu
Gangnam Beltway
Seonam Office
Geumchoen Office
Gwacheonsi
Soha IC

Aiming to apply FIN to all tunnels nationwide and identify my location at a underground parking lot in the future

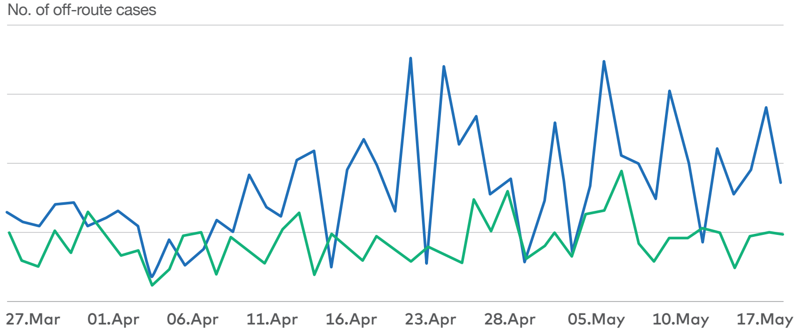
As of now, FIN based trial services are available in major tunnels including Gangnam Beltway tunnels, Namsan Tunnel and Naebu Inner Beltway tunnels. If location data from trial services and positioning technologies are developed further and service areas are expanded in the future, problems caused by GPS shadow areas will be resolved. In addition, considering mobile communication signals are received indoor or underground, FIN can be more widely used. This will be also used as all-round position identification technologies for self driving robots for underground parking lots, large shopping malls, factories as well as vehicles on the road.

A change in off-route ratio before and after FIN in 2020

Sadang IC on Gangnam Beltway



Sillim-ro Exit on Gangnam Beltway



• A change in off-route ratio before and after FIN | from Mar. 27 to May 17, 2020, based on Kakaonavi users

Getting direction inside the tunnel is putting puzzle pieces together?

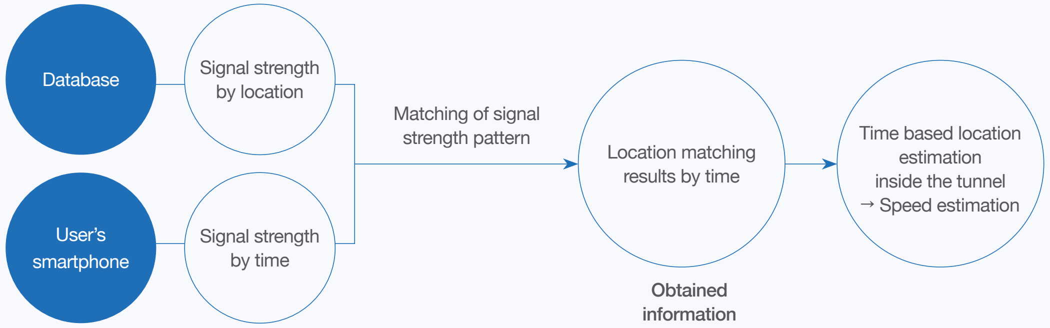
To get an understanding of FIN easily, suppose that there is a 1,000-meter long tunnel with speakers installed every 100 meter. There is a sound pattern in a speaker: “One” came out of the first speaker 100 meters away from the tunnel entrance; “Two” from the second 200 meters away; and “Three” from the third one 300 meters away. In this way, a total of nine speakers repeat the sound of each number. Now, suppose that a driver passes this tunnel. He would hear “one” when he approaches the 100 meter-point from the entrance, “five” at the 500-meter and “nine” when he approaches the 100-meter point from the end. He can figure out where he is based on the sound from each speaker although he has no GPS signals. Once he gets used to the sound pattern, he can predict that he is 450 meters from the entrance when he hears “four” and “five” similarly.

FIN is technologies analyze “LTE signals from mobile base stations”, instead of the “speaker sound” from the above hypothetical case, to identify a driver’s location. To this end, a database that saves unique LTE signal patterns from each base station by location should be established. This is a kind of LTE signal map.

Based on the established DB, LTE signals received while a Kakaonavi user passes a tunnel is analyzed. LTE signals saved in the DB and LTE signal patterns received on a user’s smartphone are compared. Then, the location of a base station at a time when LTE signals are matched is matched with the travel time. Based on this location and time information, a vehicle’s speed inside the tunnel can be calculated finally.

It looks theoretically easy, but practically applying FIN to navigation services is a matter of different dimensions. LTE signals from an actual tunnel are not as simple as numbers repeated from a hypothetical tunnel and distance intervals are not regular. In reality, LTE signals that are difficult to identify are overlapped. In addition, a big difference between hypothesis and reality is that a smartphone that receives LTE signals is inside a fast moving car. In order to make the full use of FIN technologies, they should be successfully deployed at a commercial scale.

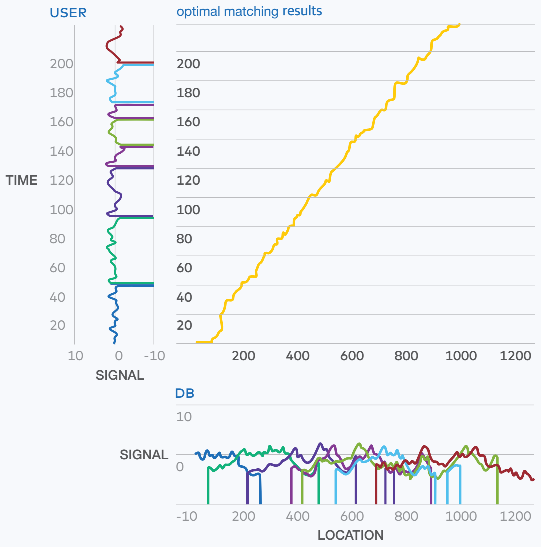
LTE signal based positioning process


Database
User’s smartphone
Signal strength by location
Signal strength by time
Matching of signal strength pattern
Location matching results by time
Time based location estimation inside the tunnel → Speed estimation
Obtained information

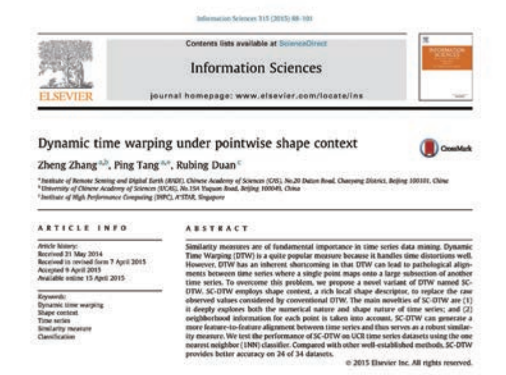
The FIN positioning process is based on pattern matching. This is like puzzle matching, that is finding locations of puzzle pieces in the entire picture. If a few pieces nearby are found, a chance of finding an accurate location becomes higher. Depending on the location, multiple signals from different base stations are overlapped. These signal pieces help find a location. This technology is called Dynamic Time Warping or DTW that uses how to measure the similarity of time series data. Let’s skip the details.

Kakao Mobility and Korea Institute of Science and Technology (KIST) have co-researched and developed FIN technologies since October 2018. Technologies of establishing location based data on an LTE signal map have been applied to Kakaonavi.

Example of signal pattern matching inside the tunnel



DTW matching theory related article



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Dynamic time warping under pointwise shape context

Zheng Zhang[a,b], Ping Tang[a,*], Rubing Duan[c]

[a] Institute of Remote Sensing and Digital Earth (RADI), Chinese Academy of Sciences (CAS), No.20 Datun Road, Chaoyang District, Beijing 100101, China
[b] University of Chinese Academy of Sciences (UCAS), No.19A Yuquan Road, Beijing 100049, China
[c] Institute of High Performance Computing (IHPC), A*STAR, Singapore

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Classification

ABSTRACT

Similarity measures are of fundamental importance in time series data mining. Dynamic Time Warping (DTW) is a quite popular measure because it handles time distortions well. However, DTW has an inherent shortcoming in that DTW can lead to pathological alignments between time series where a single point maps onto a large subsection of another time series. To overcome this problem, we propose a novel variant of DTW named SC-DTW. SC-DTW employs shape context, a rich local shape descriptor, to replace the raw observed values considered by conventional DTW. The main novelties of SC-DTW are (1) it deeply explores both the numerical nature and shape nature of time series; and (2) neighborhood information for each point is taken into account. SC-DTW can generate a more feature-to-feature alignment between time series and thus serves as a robust similarity measure. We test the performance of SC-DTW on UCR time series datasets using the one nearest neighbor (1NN) classifier. Compared with other well-established methods, SC-DTW provides better accuracy on 24 of 34 datasets.

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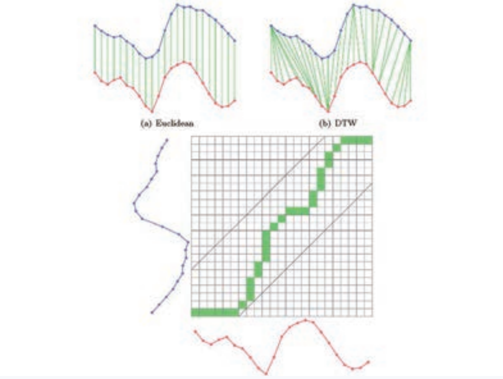


- Example of signal pattern matching inside the tunnel
  top left: signal pattern by time (a user), bottom right: signal pattern by location (DB), top right: optimal matching results
- DTW matching theory related article I Zheng Zhang et al. (2015), “Dynamic time warping under pointwise shape context”

Faster way back home with AI suggested fares

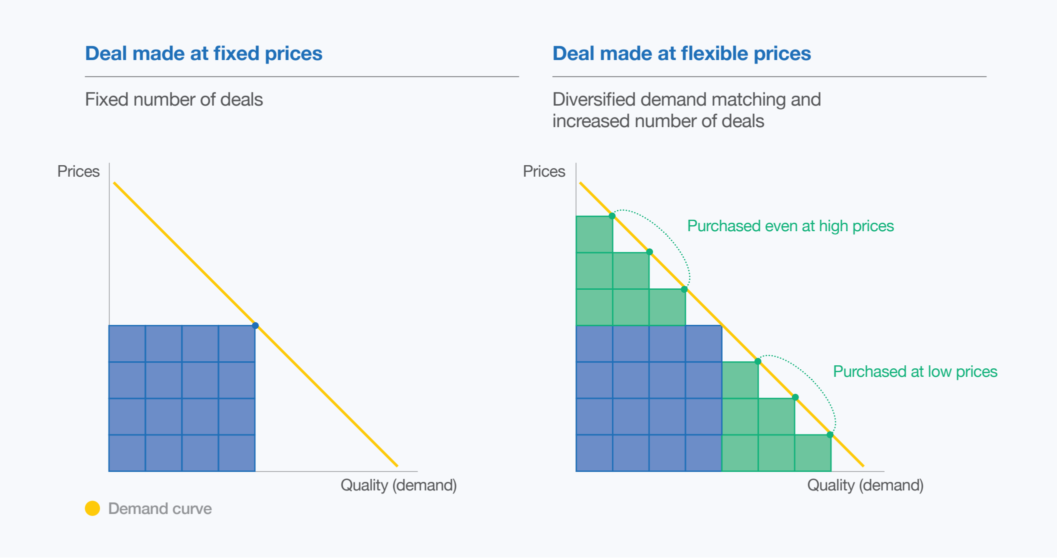
Dynamic pricing is a pricing strategy in which businesses set flexible prices for the same products or services based on market demands. It's like a stock market where bid and ask prices are always changing. Department stores and marts apply dynamic pricing as well. As closing time approaches, special price events like clearance or markdown sales are a familiar example of dynamic pricing. As prices go down, they can attract more consumers and therefore sell products that would be thrown away after closing time.

Flexible prices matches more supplies and demands

If prices can be changed, more deals could be made. This can resolve mismatches between supply and demand. Markets always see a fierce competition between a seller who wants to sell at a higher price and a buyer who wants to buy at a lower price. If prices do not change, buyers and sellers delay a deal. However, if dynamic pricing is introduced, more supplies enter into the market when prices are high. On the other hand, when prices are low, more demands enter into the market. As a result, a chance of matching supply and demand becomes higher than under fixed-price market conditions and then more deals are made.

Unlike the financial market, adjusting prices was not easy in reality. Changing price tags on a real time basis causes significant menu costs. As more deals are made based on online platforms, products and services where dynamic pricing is applied are common. Dynamic pricing is already applied to E-commerce, online ticketing, O2D services and more.

Internet connection played a key role in spreading dynamic pricing. As more common internet access allowed real time based two-way communications, costs for matching a buyer's intention and a seller's intention have sharply decreased. As internet access is available anywhere anytime with the emergence of a smartphone, many products and services that were traded offline only are being traded more and more online.



Deal made at fixed prices

Fixed number of deals

Deal made at flexible prices

Diversified demand matching and increased number of deals

AI suggested fares based on real time supply and demand

AI suggested fares are based on dynamic pricing that Kakao T Driver introduced to the market. This service lets a user know optimal fares with the fastest way back home based on an AI based analysis with consideration of supply and demand and characteristics of relevant routes. Kakaonavi introduced artificial intelligence to save a user's trouble.

It depends on the person, but people struggle to find a designated driver after alcohol involved gatherings are over. The more they want to go home, the worse it gets, especially when it rains. Why is it more difficult to find a designated driver on a rainy day? As less drivers work on a bad weather day, demand exceeds supply. The more desperate a user is, the lower a chance of finding a designated driver and going back home.

When demand exceeds supply, a user should pay for designated driver services more than usual to go back home safely. The problem is that it is hard to find out how much more a user should pay. Since designated driver services are almost products that are newly produced every moment a user calls, it is not easy to put a price on them.

The AI suggested fare service analyzes and suggests optimal fares based on AI algorithms for a user in trouble. Call situations for nearby drivers are immediately reflected on those fares on a real time basis. Those fares for the same route may change depending on changing supply and demand on a real time basis.

What does AI resolve?

Like all deals do, a deal is made when a fare that a user is willing to pay is the same as the one that a driver wants to receive. If the fare is too high, a user might wait for a cheaper service or use other means of transportation like a bus or a tax. On the contrary, if the fare is too low, a driver might wait for a user who is willing to pay more or go to other regions.

AI suggested fares introduced by Kakao T Driver are based on machine learning models that predict optimal fare levels. The models start with predicting optimal fares that both a user and a driver are happy with. A model that calculates an acceptance rate of a driver and a user respectively was created. The acceptance rate calculation model for a driver was based on more than 20 factors including a route, time, a price, and surrounding conditions. The one for a user was based on travel distance and an estimated price. The two models that learned enormous data calculate and show AI suggested fares on the app as soon as a user enters departure and destination points.

Why is dynamic pricing introduced to the designated driver market so special?

Another example is flight ticket booking services that have been very effective in using dynamic pricing. Ticket prices fluctuate depending on seasonal demands and prices for the same conditions (a schedule, a route and a seat type) may vary on a daily basis. It is common that prices are totally different depending on which website a user searches a flight ticket. Diverse ticket prices meet the needs of different consumers who are willing to pay.

The designated driver market has a structure where it is harder to introduce dynamic pricing than the flight ticket booking market. That's why the market requires relatively higher technologies in many aspects including characteristics of supply, demand and products. Above all, the difference in demand change cycle between the two markets is big. In the flight ticket booking market, demand changes in a seasonal cycle (peak season and off-season). On the other hand, demand fluctuates for a short time in the designated driver market. Supply and demand matching is very difficult.

In addition, supply is very flexible and is hard to predict. In the flight ticket booking market, however, it is common that plans of airlines determine routes, schedules, and number of seats in advance. Accordingly, the number of products are limited and it is highly likely to predict supply. On the contrary, in the designated driver market, supply changes depending on regions and time and is hard to predict. New products are produced depending on a user's location and destination on a real time basis. The number of products is almost limitless, so fixed prices hardly exist.

Designated driver market vs. Flight ticket booking market

	Designated driver market	Flight ticket booking market
Characteristics of demand	A big change in supply and demand takes place for a short time	A change in supply and demand is seasonal (peak/off-peak)
Characteristics of supply	Flexible supply (not predictable)	Fixed supply (predictable)
Characteristics of products	Products are limitless (products are produced depending on a user's location and destination on a real time basis)	Products are limited (products are produced depending on scheduled aircraft types and routes)

How effective are AI suggested fares?

Kakao T Driver introduced AI suggested fares in October 2019. How effective was this service in the market? As a result of analyzing 8-month data from November 2019 to June 2020, there was a 21% increase in a chance that a user can be matched with a driver, and a driver was matched 22% faster after a call is made. With this service, it was found that 1.7 million users went home faster.

AI based service innovation in the designated driver market is just a beginning. More data will lead to better AI. Kakao T Driver's journey to good services will go on.

SOCIAL INNOVATION

/ Kakao Mobility’s efforts to make a better society

/ Social changes based on mobility data

SOCIAL INNOVATION

/

Kakao Mobility's efforts to make a better society

Kakao T made a change in inconvenient taxi services

A taxi was introduced in 1919 in Korea. While it has been constantly developed for the last 100 years, it still has endemic problems. For example, people hail a taxi on the road, which is inconvenient and dangerous. Sometimes, they are refused by a driver because of short distance travel or have difficulties in hailing a taxi during rush hours or nighttime. These problems have been pointed out for a long time, but proper solutions had not been found yet.

Kakao T Taxi is breaking through these endemic problems with high quality data and advanced technologies. As mentioned in the previous chapter, it has been constantly improving services by applying sophisticated data technologies to user-driver matching and more. In addition, as specialized taxi call services are released, it has continued to address structural problems of supply and demand. By doing so, it aims to provide more options for users so that they can enjoy fast and convenient taxi services and new income generation opportunities for drivers and taxi business operators. So far it has introduced Smart Call that connects a taxi with high matching rates based on machine learning-driven AI technologies in April 2018 and Kakao T Blue that has an automatic matching system which makes it impossible for a driver to refuse a passenger in March 2019 to meet different mobility demands.

How have Kakao T Taxi's efforts changed our life? Let's take a close look at our daily lives that has been changed by Kakao T Taxi based on data.

Easy and convenient ride

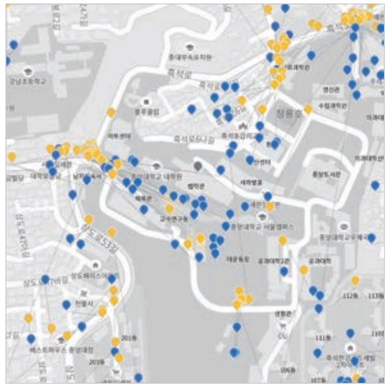
A taxi has been associated with the phrase, "catching a taxi" for a long time. If someone found an empty taxi on the street, it was common that he would waive his hand at a taxi to hail the taxi. Under this situation, a taxi user always felt nervous about when and where he should catch a taxi. Under bad weather conditions or during nighttime, competition becomes more fierce. In particular, people still compete for a taxi during nighttime around urban night spots

From “catch a taxi” to “call a taxi”

Kakao T Taxi is changing the term “catch a taxi” to “call a taxi”. Users who have easily called a taxi anywhere when necessary now feel uneasy and inconvenient about catching a taxi on the street. For those who are familiar with Kakao T Taxi, a taxi is one that they “call”. Since Kakao T Taxi was launched in 2015, the number of users has rapidly increased and taxi riding culture has changed fast.

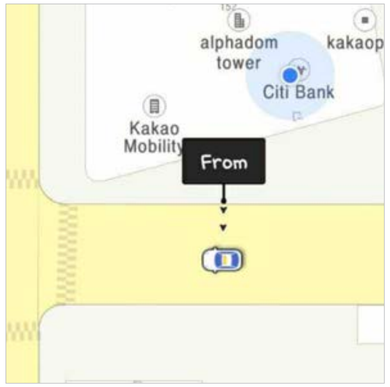
The cultural change is based on technology. Basically, automatic location identification and route guidance are based on GPS. In March 2020, the expected pickup location feature was newly added so that a driver and a user can meet easily. Although the current location is set based on GPS, additional communications are required in many cases: when driveways to apartment complexes, campuses, and large markets are not accessible from the entrance or when building structure is complicated. A user’s calling location and his actual pickup location are analyzed to find a solution. With a vehicle icon, an accessible road and a driver’s direction are shown in the app.

Example of calling and pickup locations



● Pickup location
● Calling location

A pickup location indicated with a vehicle icon

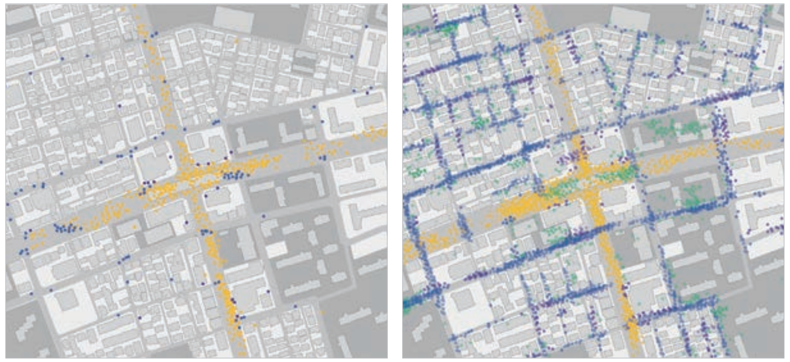


What is the difference between “catch a taxi” and “call a taxi”? Around Gangnam-gu Office, the following two cases were compared: when someone catches a taxi on the street and when someone calls a taxi. The pickup locations were classified into four categories: main roads, side roads, around a building and others.

It was found that most pickup locations when someone catches a taxi on the street were on main roads. This showed that the chance of catching a taxi on main roads where many taxis are getting round the streets is high. Main roads accounted for more than half (53%) of the entire pickup locations. On the other hand, Kakao T Taxi pickup location distribution was totally different. Pickup locations were distributed to side roads as well as main roads. Probably, Kakao T Taxi now meets the demand that was not met in the past.

Among Kakao T Taxi users’ pickup locations, main roads were 23%, a 30 percentage points decrease compared to users catching a taxi on the street. Instead, the ratios of side roads (47%) and around a building (14%) were very high. The taxi hailing app helps overcome the limitations of time and space. While a user should move to find a taxi in the past, the situation is totally changing with the spread of taxi hailing services. Now, a user can easily call a taxi on a side road, at an apartment complex or at an office. What is better, a user does not have to explain his location.

Taxi pickup location distribution around Gangnam-gu Office

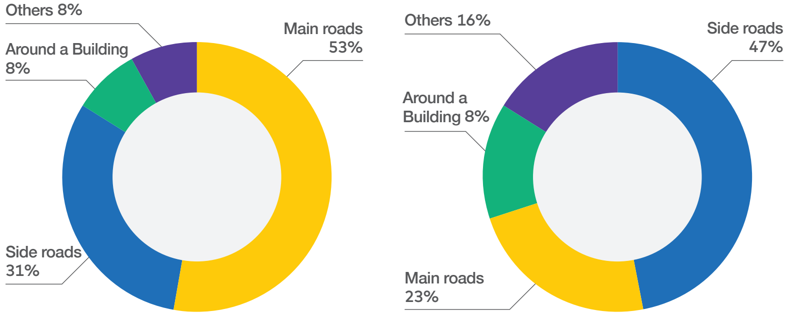


Taxi hailing on the streets

Kakao T Taxi

● Main roads
● Side roads
● Around a building
● Others

Pickup locations by category



Taxi hailing on the streets

Kakao T Taxi

- Franchise taxi catching on the street and Kakao T Taxi calls as of June 2020
- Around a building I Buildings, apartment complexes and more Main roads I Two-way roads having a minimum of two lanes

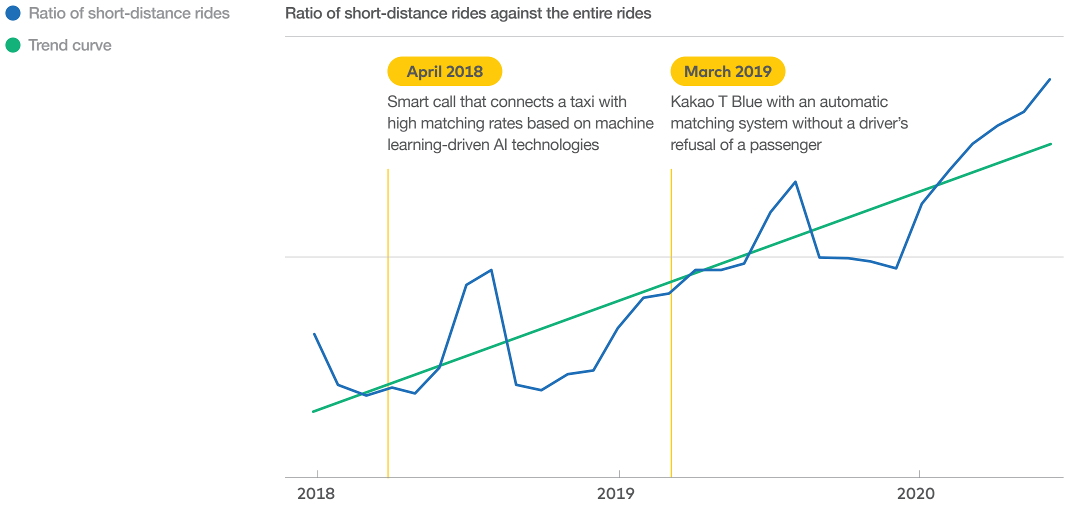
A driver's refusal of a passenger traveling a short distance drops

Another problem of taxi riding is a driver's refusal of a passenger traveling a short distance. It was found that most taxi users took a short-distance ride. On the other hand, for different reasons, few drivers preferred short-distances. In general, long-distance taxi rides are more profitable, and for short-distance taxi rides, drivers have difficulties in finding a passenger again. As more demand and less supply for short-distance rides continue, short-distance rides have been the main reason for a driver's refusal of a passenger.

Kakao T Taxi has constantly resolved this issue. As part of its efforts, matching logics, automatic matching and more services were newly launched. Let's see the data relating to short-distance rides (less than 5 kilometers) on Kakao T Taxi for the recent three years.

The ratio of short-distance rides (less than 5 kilometers) accounted for 45% of the entire rides completed on Kakao T Taxi in 2018. As of the first half of 2020, it was 50%, a 5 percentage points increase for the last three years. This data shows that the ratio of short distance rides that drivers avoided despite high demand has constantly increased.

A change in short-distance rides on Kakao T Taxi

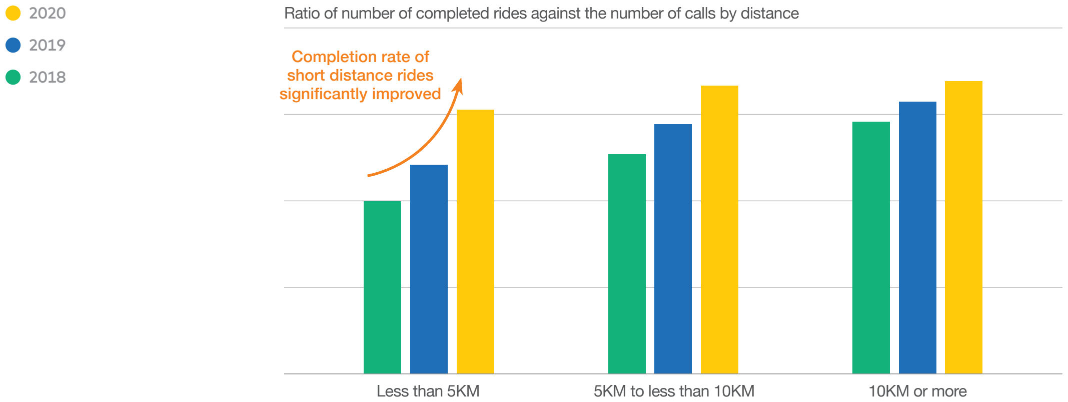


• A change in short-distance rides on Kakao T Taxi I Based on less than 5-kilometer rides completed nationwide

Short distance service conditions have improved especially in Seoul where users experienced inconveniences caused by unsuccessful matching with a driver. The ratio of short distance rides completed by each driver during the first half of 2020 in Seoul was 31% on Kakao T Blue which is 4 percentage points higher than only 27% on regular taxis. Kakao T Blue introduced its services first in Seoul. If Kakao T Blue that marks the second anniversary in 2020 settles in, its ratio of short distance rides in Seoul is expected to rise. It was also found that the completion rate of short distance rides improved.

The completion rate is the ratio of rides completed by a driver upon a user's call. Among the completion rates by travel distance, the completion rate of short distance rides recorded the highest growth for the recent three years. As drivers prefer long distance rides, the completion rate of long distance rides was the highest all the time. As the completion rate of short distance rides has rapidly improved, this gap continues to narrow. It seems attributable to Smart Call that increases a driver's matching acceptance rate based on AI technologies and Kakao T Blue with automatic matching applied.

A change in completion rates of Kakao T Taxi rides by distance



• A change in completion rates of Kakao T Taxi rides by distance based on Kakao T Taxi rides completed from 2018 to the first half of 2020

Increased travel during peak hours

Finally, “excessive demand during peak hours” still remains unsolved in the taxi market. While demand for a taxi during rush hours and nighttime is excessive, taxi supply does not frequently meet such demand. Above all, there is a limited number of available taxis. In many cases, a user’s destination does not match the destination that a driver wants. In a region where a driver cannot pick up a passenger on the road due to traffic congestion, the profit against operation hours drops. That’s why some drivers avoid such a region. During peak hours when demand is relatively high, a driver is more likely to refuse a passenger.

Kakao T Taxi found a solution by releasing useful call products that help adjust supply and demand. Let’s look at the data to see how much it has contributed to controlling this disproportionate supply and demand for the last three years.

The following four target regions were analyzed: Jongno 1~4 dong, Yeouido-dong, Yeoksam 1-dong and Itaewon 1-dong. It is hard to hail a taxi during peak hours in the four regions. The number of calls for special taxi call services (Smart call and Kakao T Blue) by time for these four regions were compared and analyzed. As a result, it was found that as time went by, special taxi call service usage was increasing. In particular, the service usage increase was noticeable during peak hours when it was hard to hail a taxi.

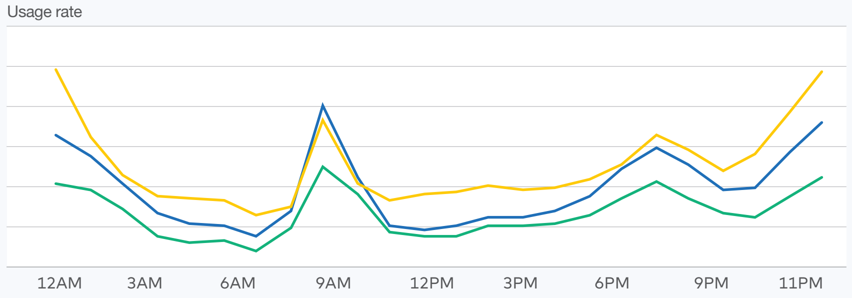
The ratio of special taxi call service usage in the target regions was on the rise over time. It was noticeable especially during evening rush hours and nighttime. It seems that short distance rides increased during evening rush hours and nighttime and users’ favorite destinations were busy areas like business districts and entertainment districts. In particular, Smart calls and Kakao T Blue calls sharply increased in Itaewon after midnight and in Yeoksam 1-dong, Gangnam-gu during morning rush hours. As Gangnam Station and Seolleung Station are in Yeoksam 1-dong, Gangnam-gu, this region has business, shopping and entertainment districts as well as residential districts. These two services were popular during morning rush hours when commuters were busy and worried about being late.

This means Kakao T Taxi’s two services have significantly contributed to addressing excessive demand issues during peak hours. Kakao T Taxi is and will continue to work hard for the day when no user has trouble hailing a taxi due to this disproportionate supply and demand situation.

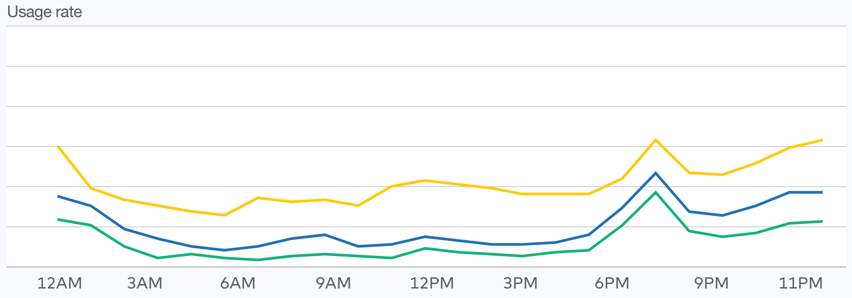
A change in special taxi call service usage rate

● 2020
● 2019
● 2018

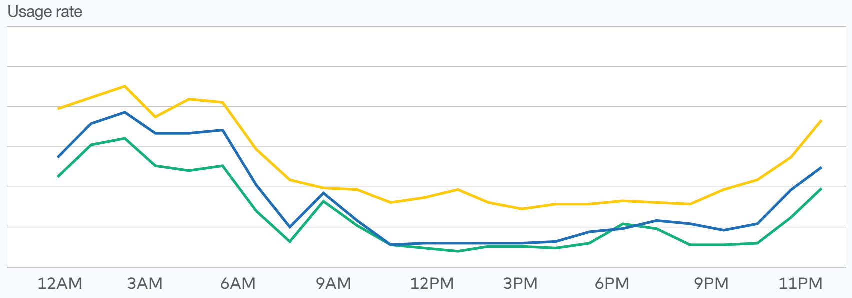
Yeoksam 1-dong, Gangnam-gu



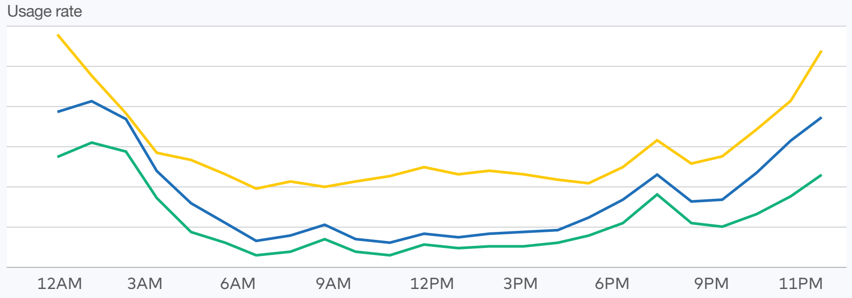
Yeouido-dong, Yongdeungpo-gu



Itaewon 1-dong, Yongsan-gu



Jongno 1,2,3,4-dong, Jongno-gu



• **A change in special taxi call service usage rate** I A change in Smart call and Kakao T Blue usage ratio of the entire completed services by time based on the first half of 2020

Kakao Mobility
x
Seoul Digital
Foundation

Urban parking problem solving based on data

Parking issues are an unexpected hardship when it comes to urban traffic problems. While many people associate traffic congestion on the road with urban traffic problems, a majority of urban problems are caused by parking. Driving a car starts and ends with parking and a car spends 95% of its lifetime parked, not on the road. As cars wait and get around on the road to look for a parking spot in urban areas, traffic congestion is caused. Parking problems have caused different social expenses as much as they are called parking pains. Traffic specialist INRIX Research found that the US drivers spend 17 hours finding a parking spot every year on average and those in big cities like New York and LA spend more than 80 hours annually. In addition, economic costs caused by parking in the United States amounted to 454 dollars per driver every year and more than 75% of such costs were caused while a driver waits and gets around to find a parking spot.
Parking problem in Seoul is serious as well. Chronic traffic congestion caused while drivers wait and get around to park a car in Seoul is considered as one of the social problems. Samsung Traffic Safety Culture Research Institute found that social and economic costs caused when drivers fail to find a parking spot and illegally park a car reached 4.897 trillion won annually in Seoul.

Urban areas need to use space efficiently

Among different parking problems, it is hard to solve parking problems especially in the city center areas. Since land prices are high and available land space is absolutely limited, it is not easy to increase parking supply. On the other hand, its demand is quite variable due to a large floating population. In the city center areas, a floating population is bigger than a permanent population and increases especially during peak hours. Although an enormous budget is invested in securing more parking spaces, the center areas will face a tricky situation where those spaces are empty after they leave.

Global city governments including the Seoul government has introduced a policy to control parking demand. As parking supply under their previous policies reached the limitation in those cities, they started to implement parking supply-control policies to fundamentally prevent parking demand. However, it was hard to fully prevent demand for drivers for travelling to commercial facilities at the center. Office parking spaces were repeatedly crowded with vehicles that visit and leave the city center areas during rush hours on weekdays. Lots of cars wait in line to park at mega shopping malls every weekend.

The opportunity costs caused to secure parking spaces are high and the ratio of floating population is high. How can parking problems of city center areas be solved? Kakao Mobility and Seoul Digital Foundation have identified solutions for parking problems in Seoul. Seoul Digital Foundation is a think tank of the Seoul Metropolitan government to resolve urban problems of Seoul by applying sophisticated digital technologies. Both organizations performed co-researches to solve nighttime traffic problems in Seoul in 2019 and discussed together to resolve parking problems at the center of Seoul this year.

Solutions were in the data. They identified how urban parking demand is generated based on data to find a way to connect and share parking lots distributed to buildings at the center. Based on enormous data from Kakao T Parking and Kakaonavi, they reviewed measures to address supply and demand mismatch based on time and spaces.

Seoul's parking patterns are divided into leisure-, business- and life-driven patterns

As a result of analysis, parking demand patterns were divided into three categories in all POIs (Point of Interest) in Seoul: leisure-, business- and life-driven patterns. First of all, the leisure-driven parking demand pattern (Type 1) showed the peak time in the evening on weekdays, higher demand on weekends than on weekdays and concentrated parking demand during both lunchtime and dinnertime. Key POIs in Type 1 include residential facilities, subway stations, sports and leisure facilities, parks, accommodation facilities, restaurants and public transportation facilities. Second, the business driven parking demand pattern (Type 2) showed the peak time during morning rush hours and lunchtime on weekdays and a sharp decrease on weekends compared to weekdays. POIs in Type 2 are places for business including business facilities, educational facilities and medical facilities. Finally, the life-driven parking demand pattern (Type 3) showed the peak time around lunchtime on weekdays and weekends and demand is higher on weekends than on weekdays. POIs in Type 3 include large shopping malls, educational facilities, public institutions and travel facilities.

Data overview

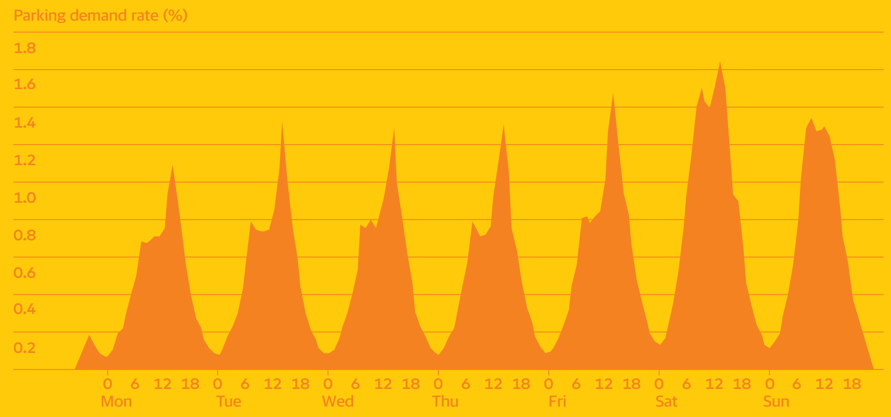
Source	Departure and destination data from Kakaonavi
Target	Data where destination points are in Seoul (departure points are nationwide)
Period	Jan. 2019 ~ Dec. 2019
No. of cases	147.19 million
Departure and destination POI classification	14 categories in a main group and 139 categories in a sub group

Category based parking demand patterns

Time based parking demand rate on weekdays,
Jan. 2019 ~ Dec. 2019, based on POI averages by category

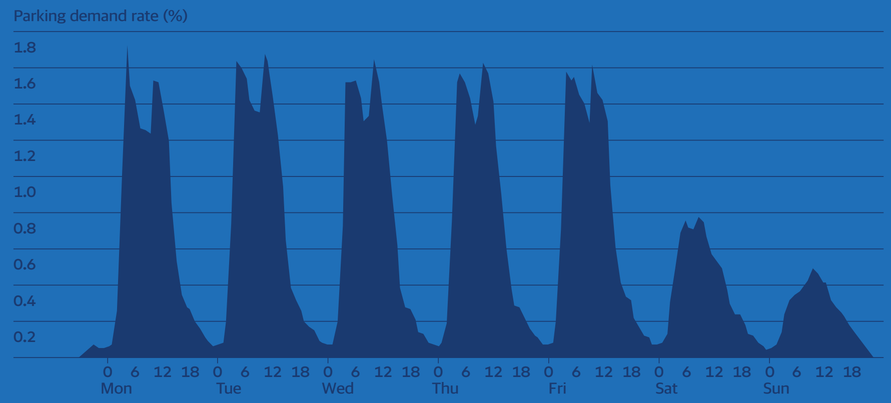
TYPE 1.
Leisure

Peak time
- Weekdays : evening
- Weekends : lunchtime/evening



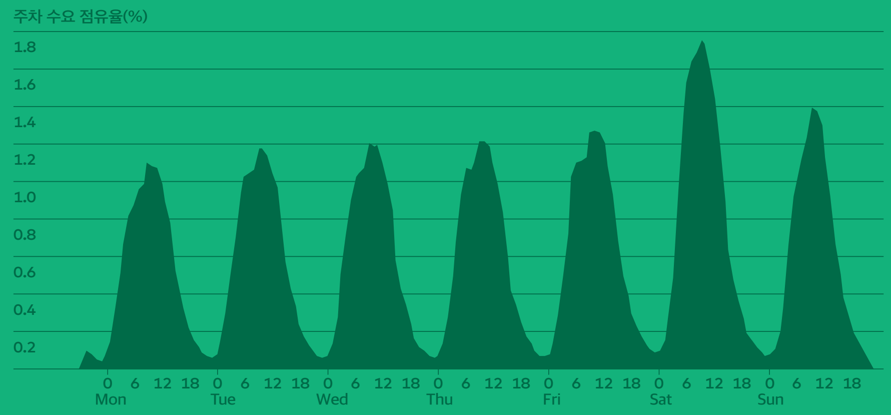
TYPE 2.
Business

Peak time
- Weekdays : morning/lunchtime
- Weekends : less demand on weekends



TYPE 3.
Life

Peak time
- Weekdays : weekdays lunchtime
- Weekends : more demand on weekends



Possibility of geographically dispersing parking demand

In order to review the possibility of geographically dispersing parking demand, parking demand distribution was analyzed within a radius of 250 meters and 500 meters zones from a landmark with a critical limit of 500 meters which is a 5-minute walking distance. As defined by the Seoul government, the primary metro station area is within a radius of 250 meters from each station and the secondary area is within a radius of 500 meters. Both areas are widely accepted as being within a walking distance from each station. How many destinations are distributed within a walking distance from a landmark for the purpose of reviewing a possibility of parking demand dispersion was reviewed to confirm how much parking demand can be geographically dispersed.

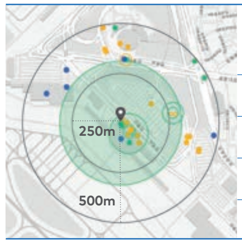
Available destinations for parking demand dispersion on weekdays and on weekends based on category-based parking demand patterns were reviewed. The concentric circles in the picture showing geographical distribution of demand by category are areas within a radius of 250 meters and 500 meters from a landmark. POIs around a landmark are displayed as yellow for Type 1, blue for Type 2 and green for Type 3 and the size of each dot varies depending on relative visit frequency of relevant POI.

Geographical distribution of parking demand at metropolitan transportation facilities

At metropolitan transportation facilities, a landmark's parking demand type was different depending on its location and characteristics. Airports and bus terminals were Type 3 and metro stations were Type 1. Since metropolitan transportation facilities basically accounted for more than half of parking demand around relevant landmarks, parking demand distribution conditions were not good.

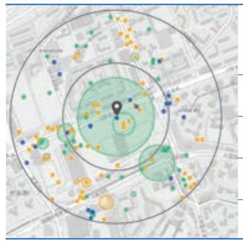
In particular, Gimpo Airport's parking demand type accounted for over 90% within a radius of 500 meters as well as 250 meters. This means that the airport should secure its own parking spaces to meet its parking demand.

Geographical distribution of parking demand and type-based demand rate at metropolitan transportation facilities



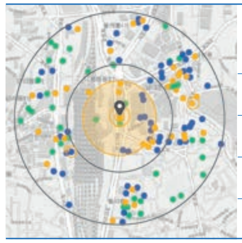
Gimpo International Airport
● Type 3

Type	250m	500m
1	0.1%	5.4%
2	0.7%	1.3%
3	99.3%	93.2%



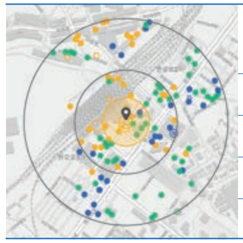
Seoul Express Bus Terminal
● Type 3

Type	250m	500m
1	2.2%	19.1%
2	1.5%	2.2%
3	96.3%	78.7%



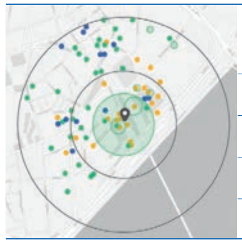
Seoul Station
● Type 1

Type	250m	500m
1	75.1%	62.8%
2	10.2%	15.9%
3	14.8%	21.3%



Yongsan Station
● Type 1

Type	250m	500m
1	56.9%	52.1%
2	9.3%	10.9%
3	33.8%	37.0%



East Seoul Intercity Bus Terminal
● Type 3

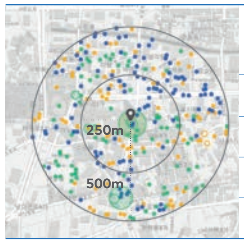
Type	250m	500m
1	6.3%	18.6%
2	1.0%	2.0%
3	92.8%	79.4%

● Type1. Leisure
● Type2. Business
● Type3. Life

Geographical distribution of parking demand at mega shopping malls

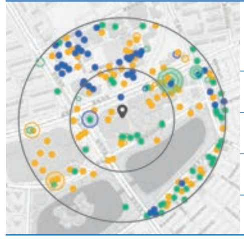
All mega shopping malls showed Type 3. Unlike metropolitan transportation facilities, office buildings and residential facilities were located around mega shopping malls. For this reason, relatively different parking demand patterns around relevant landmarks were found. In the city center areas, other types that are different from relevant landmarks were found even within a radius of 250 meters. This means that city center landmarks have relatively more parking spaces for demand dispersion.

Geographical distribution of parking demand and type based demand rate at mega shopping malls



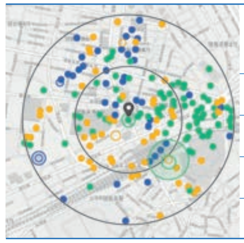
Lotte Department Store Main Branch ● Type 3

Type	250m	500m
1	36.9%	27.6%
2	9.5%	21.4%
3	53.6%	51.0%



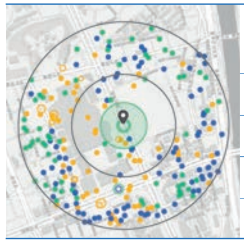
Lotte World Tower ● Type 3

Type	250m	500m
1	29.3%	26.6%
2	27.7%	19.6%
3	43.0%	53.9%



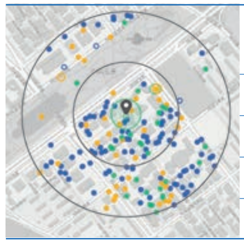
TimeSquare ● Type 3

Type	250m	500m
1	75.1%	62.8%
2	10.2%	15.9%
3	14.8%	21.3%



Coex ● Type 3

Type	250m	500m
1	16.8%	24.9%
2	16.3%	18.9%
3	66.9%	56.2%



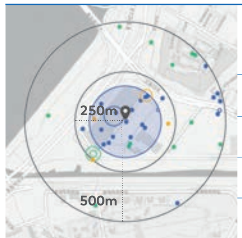
Yeouido IFC Mall ● Type 3

Type	250m	500m
1	26.7%	21.0%
2	32.2%	42.7%
3	41.1%	36.3%

Geographical distribution of parking demand at university hospitals

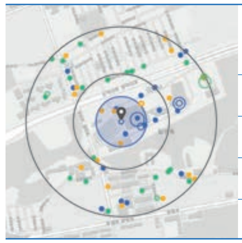
University hospitals showed the business-driven parking demand pattern (Type 2). Except for the Seoul ST. MARY's Hospital (Catholic University of Korea) close to the city center area, their parking demand rate was high. Like metropolitan transportation facilities, frequency of other parking demand patterns was low within a radius of 250 meters and 500 meters from university hospitals.

Geographical distribution of parking demand and type based demand rate at university hospitals



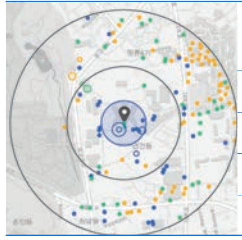
Asan Medical Center ● Type 2

Type	250m	500m
1	14.7%	17.3%
2	75.2%	70.7%
3	10.1%	12.0%



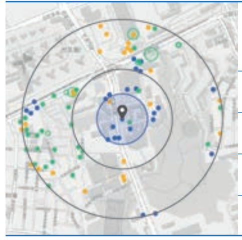
Seoul Express Bus Terminal ● Type 2

Type	250m	500m
1	2.2%	19.1%
2	1.5%	2.2%
3	96.3%	78.7%



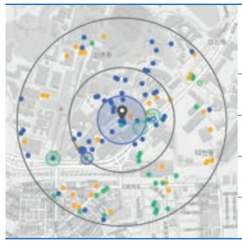
Seoul National University Hospital ● Type 2

Type	250m	500m
1	7.2%	14.0%
2	85.7%	56.5%
3	7.1%	29.5%



Catholic University Hospital ● Type 2

Type	250m	500m
1	0.4%	40.4%
2	88.2%	45.5%
3	11.4%	14.1%



Severance Hospital ● Type 2

Type	250m	500m
1	14.2%	14.3%
2	68.5%	50.2%
3	17.3%	35.5%

● Type1. Leisure
● Type2. Business
● Type3. Life

Possibility of parking demand dispersion by landmark

Parking demand dispersion is expected to be more effective when each type shows similar demand rate. If a specific type shows an overwhelmingly high demand rate, parking spaces are limited to meet parking demand although each type shows different demand distributions. For this reason, demand dispersion is less likely to be effective. Based on geographical distributions of parking demand and category based demand rates, landmarks that show ineffective demand dispersion can be figured out.

As shown in the Gimpo International Airport case, airports have absolutely few POI for parking demand dispersion within a radius of 500 meters as well as 250 meters. They are located outside of the city center areas and in a condition that high-rise buildings cannot be built nearby. On the contrary, metro stations or bus terminals located at the city center have relatively more POIs nearby for demand dispersion than airports.

For university hospitals close to the city center, many POIs were distributed nearby for parking demand dispersion. In particular, Seoul National University Hospital, Catholic University of Korea Seoul ST. MARY's Hospital and Severance Hospital showed lower parking demand on weekends than on weekdays. It seems that demand can be dispersed by using parking spaces for other types on weekdays and providing their extra parking spaces for other types on weekends.

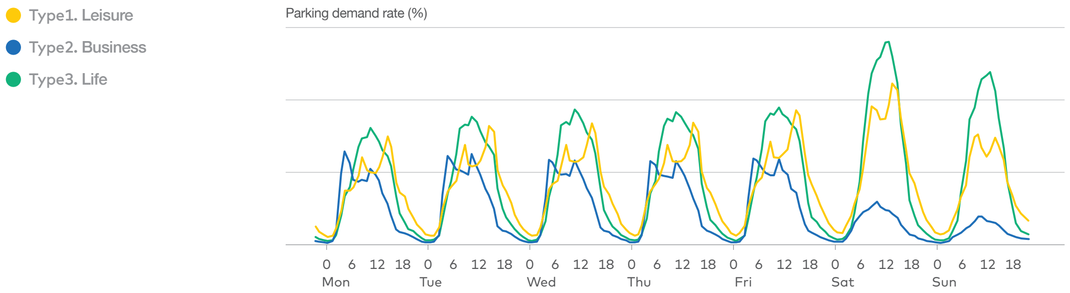
For mega shopping malls, time distribution as well as geographical distribution of parking demand need to be considered. Since they are located at the city center, parking demand can be dispersed geographically. They showed excessive demand at specific times (the peak time on weekends), so time distribution significantly affects parking demand dispersion. Mega shopping malls showed high demand of Type 3 on weekends compared to on weekdays. However, they showed relatively high demand of Type 2 that showed lower demand on weekends than on weekdays. In addition, their parking demand is relatively high for Type 1 on weekdays morning and for Type 2 on weekdays evening.

Considering geographical and time distributions of parking demand at landmarks, parking demand for mega shopping malls is more likely to be dispersed than metropolitan transportation facilities and university hospitals. Since Type 2 and Type 3 showed opposite demand patterns at mega shopping malls on weekends, sharing parking spaces on weekends is highly likely to help disperse parking demand. Even on weekdays, Type 1 and Type 2 showed opposite demand patterns on weekdays morning and evening, so sharing parking spaces on weekdays is likely to help disperse parking demand.

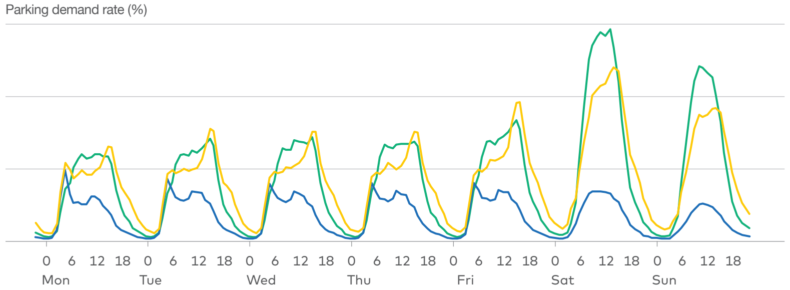
Among mega shopping malls, it was found that parking demand dispersion would be more effective at IFC Malls, Lotte Department Store Main Branch, Time Square and Coex. If parking demand patterns based on parking information help connect parking spaces of other facilities, the effectiveness of parking demand dispersion is expected to be high. On the contrary, type-based demand is highly likely to be dispersed at Lotte World Tower. Since nearby apartment parking spaces have a high ratio of Type 1, however, it does not seem easy to open those parking spaces to the public. It was also found that reliable parking space management and systematic incentives that interested parties of relevant facilities are happy with would be required to connect and open parking spaces.

Time based parking demand distribution at mega shopping malls

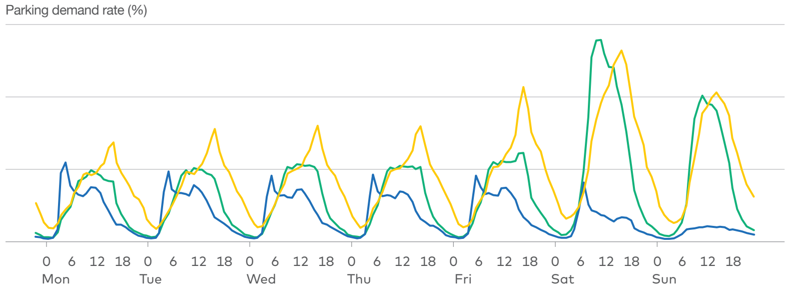
Lotte Department Store Main Branch



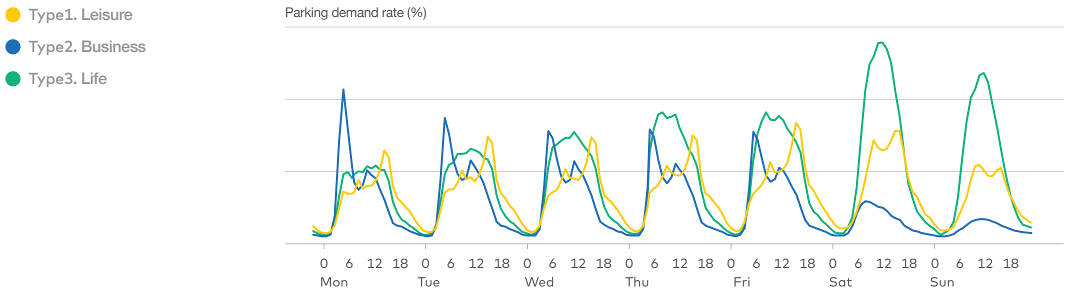
Lotte World Tower



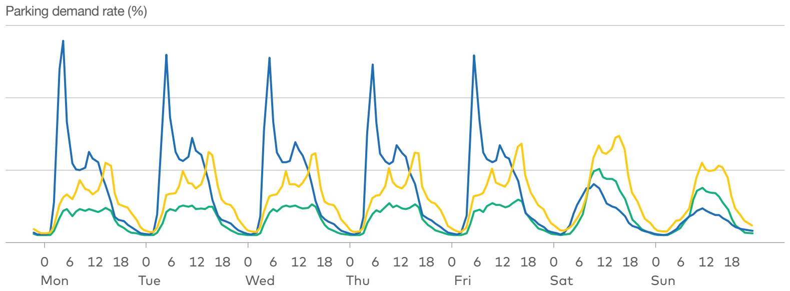
Time Square



Coex



IFC Mall



Late night shuttle lines suggested for designated drivers

Call connection would be one of the most important abilities to become a veteran designated driver. Call connection means catching a call after checking the destination of a user and is a jargon widely used among designated drivers. It was created to find ways to catch the most calls a driver could for about 4 hours of peak time. The more it takes to get to the destination, the less they catch a call, having less earnings.

What is a good destination then? Designated drivers prefer regions close to where many calls are made. In fact, it is ironic that popular departures and destinations are far in most cases. During service hours of public transportation, a driver can rapidly go to where he wants to go even if he catches a call for an unpopular destination point. After public transportation is not available, it is hard to go somewhere, so most drivers avoid destination points far from popular departure points.

Popular departures and destinations among designated drivers

The most calls came from Suwon Ingye-dong based on dong (an administrative sub-unit in Korea) and Gangnam-gu based on gu (an administrative unit). Office districts and commercial districts gather in those regions. Actually, many designated drivers were waiting for a call in those regions. Most popular departure and destination points were connected to inter-regional buses instead of subway stations. After midnight, however, they avoided these points because taxi was the only option available to come back to departure points.

What if there is a shuttle that can connect those two points even after public transportation stops running? In this case, more users could use designated driver services and drivers would have more earnings. Is this possible? To this end, the most efficient shuttle lines were figured out based on call rates of departure points and distances between two points.

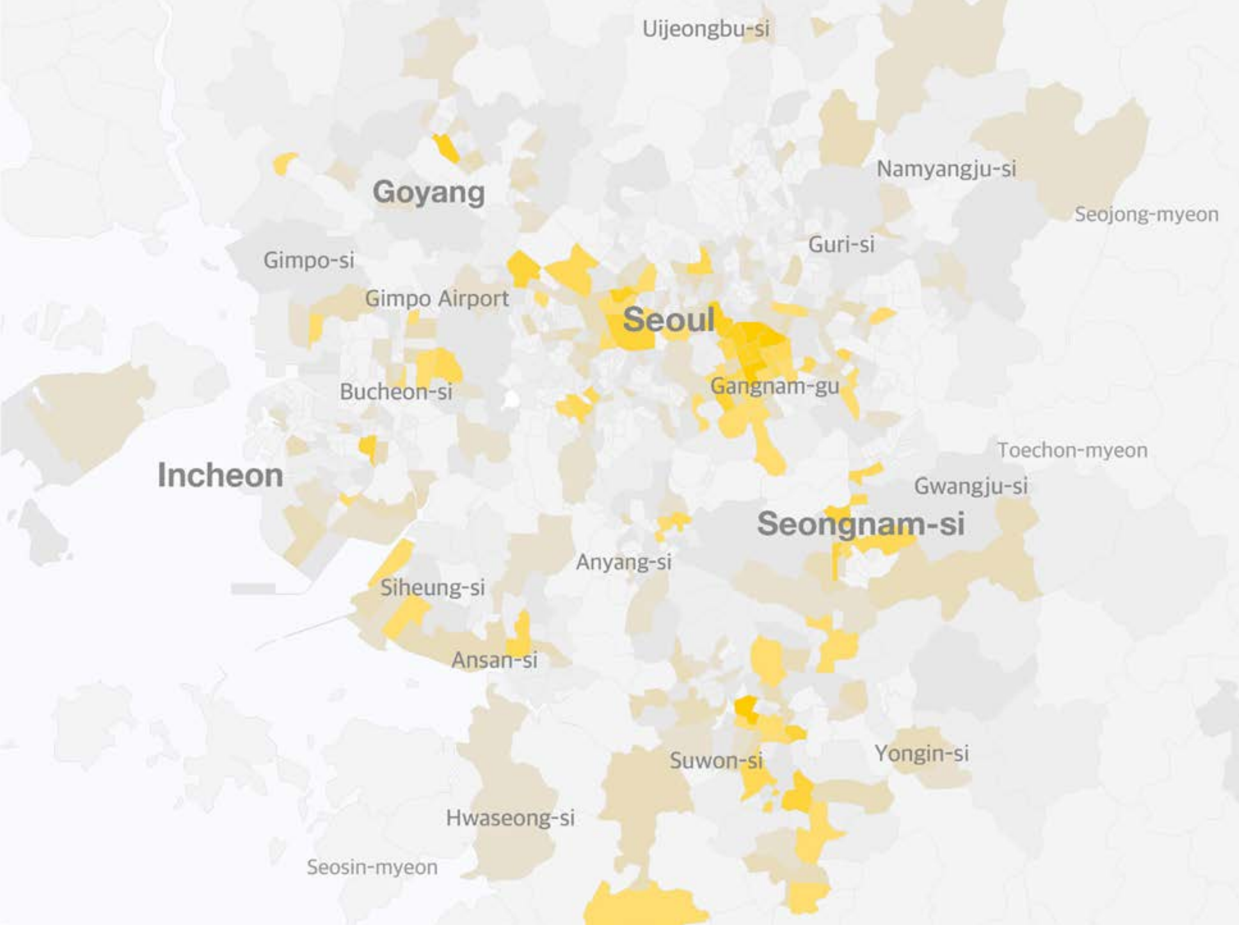
Kakao T Driver top departures in the metropolitan area

Rank	Region 1 (do,si)	Region 2 (si, gu)	Region 3 (dong)
1	Gyeonggi	Suwon Paldal	Ingye
2	Seoul	Gangnam	Yeoksam 1
3	Seoul	Gangnam	Cheongdam
4	Seoul	Gangnam	Apgujeong
5	Seoul	Gangnam	Nonhyeon 2
6	Seoul	Mapo	Seogyo
7	Seoul	Yongsan	Hannam
8	Gyeonggi	Goyang Ilsandong	Janghang 2
9	Seoul	Gangnam	Sinsa
10	Seoul	Gangnam	Nonhyeon 1
11	Gyeonggi	Hwaseong	Dongtan 1
12	Seoul	Yeongdeungpo	Yeouido
13	Seoul	Yongsan	Itaewon 1
14	Gyeonggi	Suwon Yeongtong	Yeongtong 3
15	Gyeonggi	Seongnam Bundang	Samyeong
16	Gyeonggi	Seongnam Bundang	Jeongja 1
17	Incheon	Namdong	Guwol 3
18	Seoul	Gangseo	Gayang 1
19	Seoul	Seocho	Seocho 3
20	Seoul	Gangnam	Samseong 2

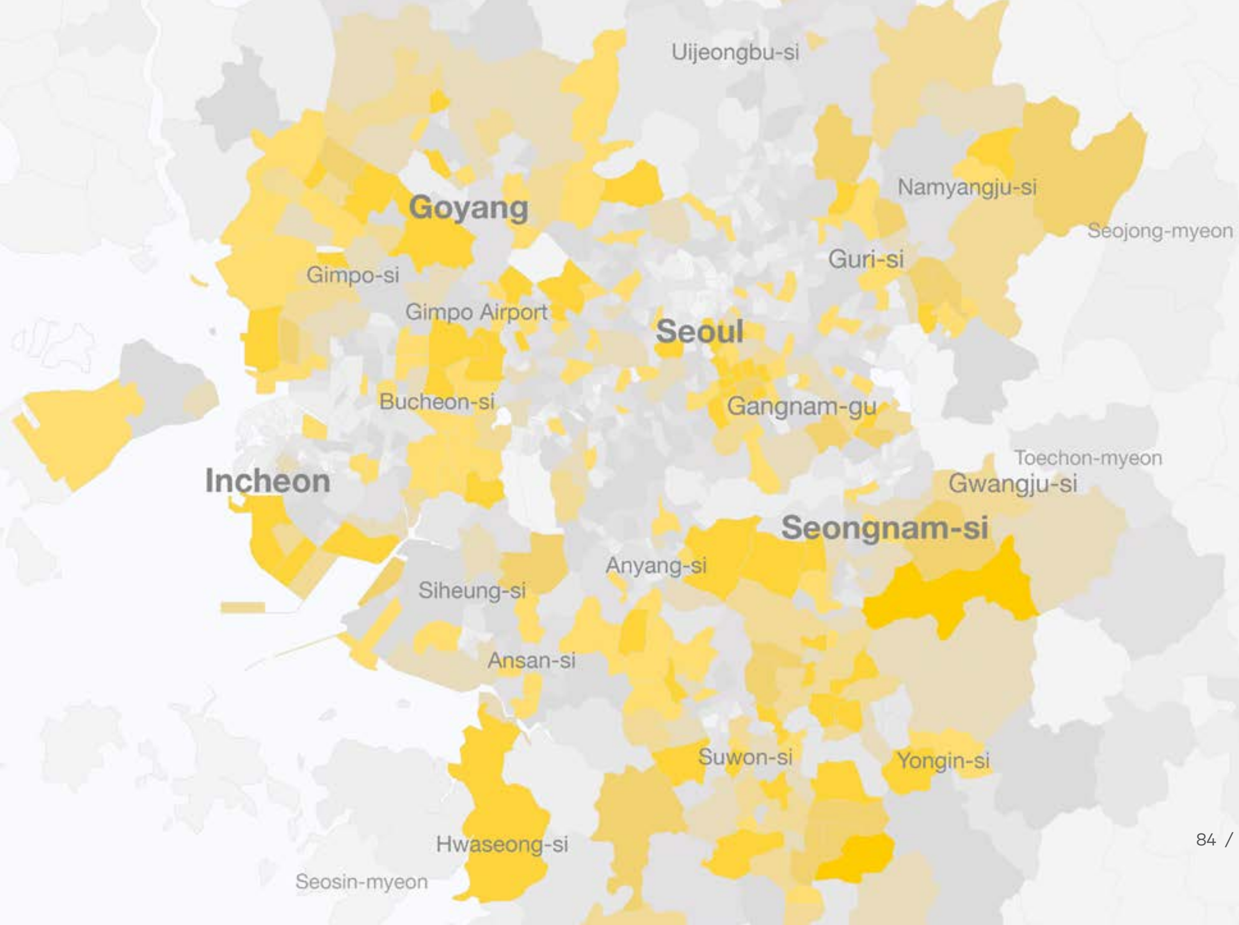
Kakao T Drive top destinations in the metropolitan area

Rank	Region 1 (do,si)	Region 2 (si, gu)	Region 3 (dong)
1	Gyeonggi	Gwangju	Opo
2	Gyeonggi	Hwaseong	Dongtan 6
3	Gyeonggi	Yongin Giheung	Dongbaek
4	Gyeonggi	Namyangju	Dasan 1
5	Gyeonggi	Suwon Yeongtong	Gwanggyo 1
6	Seoul	Gangnam	Yeoksam, 1
7	Gyeonggi	Siheung	Baegot
8	Gyeonggi	Namyangju	Byeollae
9	Gyeonggi	Hwaseong	Bongdam
10	Gyeonggi	Namyangju	Hwado
11	Gyeonggi	Hanam	Misa 2
12	Seoul	Gangnam	Segok
13	Gyeonggi	Seongnam Sujeong	Wirye
14	Gyeonggi	Gimpo	Munyang
15	Gyeonggi	Yongin Suji	Seongbok
16	Gyeonggi	Gwangju	Gwangnam
17	Gyeonggi	Hanam	Misa 1
18	Gyeonggi	Hwaseong	Dongtan 5
19	Gyeonggi	Hwaseong	Dongtan 4
20	Incheon	Seo-gu	Cheongna 2

• Kakao T Driver top departures and destinations in the metropolitan area I Based on calls from 12am to 6am in 2019


Uijeongbu-si
Goyang
Namyangju-si
Seojong-myeon
Gimpo-si
Guri-si
Gimpo Airport
Seoul
Bucheon-si
Gangnam-gu
Incheon
Toechon-myeon
Gwangju-si
Seongnam-si
Anyang-si
Siheung-si
Ansan-si
Suwon-si
Yongin-si
Hwaseong-si
Seosin-myeon

Departure based call distribution


Uijeongbu-si
Goyang
Namyangju-si
Seojong-myeon
Gimpo-si
Guri-si
Gimpo Airport
Seoul
Bucheon-si
Gangnam-gu
Incheon
Toechon-myeon
Gwangju-si
Seongnam-si
Anyang-si
Siheung-si
Ansan-si
Suwon-si
Yongin-si
Hwaseong-si
Seosin-myeon

Destination based call distribution

Suggested line 1 Seongnam > Gwangju Opo

Gwangju Opo ranked first in destinations coming from Seongnam. While Gwangju has inconvenient public transportation connected to Bundang and Pangyo where lots of people work, they are geographically close to each other and commuting by car is easy. It seems that many of those working in Bundang and Pangyo are living in Gwangju Opo. People are constantly moving into new apartments in the region and its population continues to grow. While they are geographically close, they have a poor public transportation system between Seongnam (Bundang and Pangyo) and Gwangju Opo and a high commuting by car ratio. For this reason, the Seongnam-Gwangju Opo line was selected as the top pick.

Suggested line 1 Seongnam -> Gwangju Opo

Gwangju-si
Seongnam-si
-si

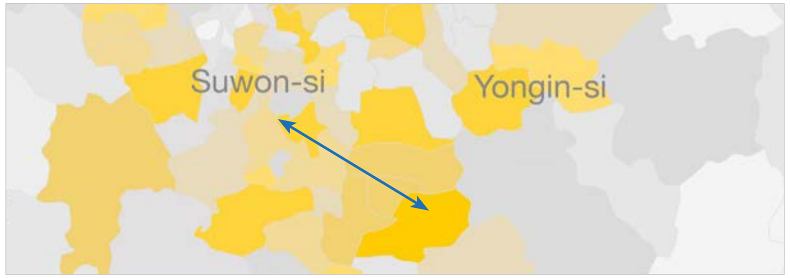
Kakao T Driver top destinations coming from Seongnam-si

Rank	Region 1 (do)	Region 2 (si, gu)	Region 3 (dong, eup)
1	Gyeonggi	Gwangju	Opo
2	Gyeonggi	Gwangju	Gwangnam
3	Gyeonggi	Yongin Giheung	Dongbaek
4	Gyeonggi	Gwangju	Songjeong
5	Gyeonggi	Yongin Suji	Dongcheon
6	Gyeonggi	Yongin Suji	Jukjeon 1
7	Gyeonggi	Seongnam Sujeong	Wirye
8	Gyeonggi	Yongin Suji	Seongbok
9	Gyeonggi	Yongin Suji	Sinbong
10	Gyeonggi	Yongin Giheung	Bojeong
11	Gyeonggi	Yongin Giheung	Guseong
12	Gyeonggi	Seongnam Bundang	Unjung
13	Gyeonggi	Seongnam Bundang	Jeongja 1
14	Gyeonggi	Yongin Suji	Sanghyun 1
15	Gyeonggi	Yongin Giheung	Mabuk
16	Gyeonggi	Suwon Yeongtong	Gwanggyo 1
17	Gyeonggi	Gwangju	Chowol
18	Gyeonggi	Seongnam Bundang	Bundang
19	Gyeonggi	Gwangju	Gyeongan
20	Gyeonggi	Yongin Cheoin	Mohyeon

Suggested line 2 Suwon > Hwaseong

Hwaseong-si ranked first in destination from Suwon. Like the Songnam-Opo line, Suwon, where lots of people work for large companies like Samsung, is physically close to Hwaseong but has inconvenient subway access between Suwon and Hwaseong. It seems that many of those living in Dongtan, a new large town in Hwaseong, commute to Suwon by car. The Suwon-Hwaseong line is also expected to be efficient.

Suggested line 2 Suwon -> Hwaseong



Kakao T Driver top destinations coming from Suwon-si

Rank	Region 1 (do)	Region 2 (si, gu)	Region 3 (dong, eup)
1	Gyeonggi	Hwaseong	Dongtan 6
2	Gyeonggi	Hwaseong	Bongdam
3	Gyeonggi	Suwon Yeongtong	Gwanggyo 1
4	Gyeonggi	Hwaseong	Jinan
5	Gyeonggi	Suwon Gwonseon	Homaesil
6	Gyeonggi	Hwaseong	Dongtan 5
7	Gyeonggi	Hwaseong	Dongtan 4
8	Gyeonggi	Yongin Giheung	Youngdeok
9	Gyeonggi	Hwaseong	Dongtan 3
10	Gyeonggi	Suwon Gwonseon	Pyeong-dong
11	Gyeonggi	Hwaseong	Dongtan 7
12	Gyeonggi	Suwon Paldal	Ingye
13	Gyeonggi	Hwaseong	Banwol
14	Gyeonggi	Hwaseong	Dongtan 1
15	Gyeonggi	Suwon Gwonseon	Geumgok
16	Gyeonggi	Suwon Gwonseon	Gwonseon 2
17	Gyeonggi	Suwon Yeongtong	Gwanggyo 2
18	Gyeonggi	Suwon Yeongtong	Woncheon
19	Gyeonggi	Yongin Giheung	Dongbaek
20	Gyeonggi	Osan	Sema

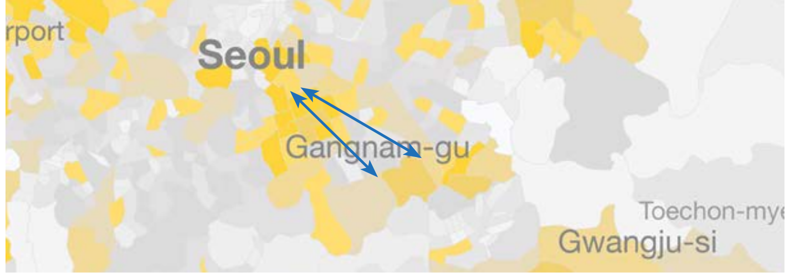
• Suggested line #1 and #2 I Based on calls from 12am to 6am in 2019

Suggested line #3 Gangnam > Segok and Wirye

Most calls were from Gangnam to Gangnam. Top departure points were Gangnam Station and Yeoksam Station. However, there were many residential districts in Dogok, Banpo and Apgujeong and there was high demand for those who wanted to go to another place after dinner. Outside of the Gangnam area, there were many calls from Wirye, Segok and Gwangju. While these regions are new towns with a large population, they have a poor public transportation system including subway and a high commuting by car ratio. The Gangnam-Wirye and Segok line would be more efficient than Gwangju which is physically far from Gangnam.

After public transportation stops running, late night shuttles can be a good option for designated drivers. As they move more easily, users are expected to experience better services. As a result, the number of those driving under the influence will decrease and our society will be able to move one step forward to a safer and more convenient world.

Suggested line Gangnam -> Segok, Wirye



Kakao T Driver top destination coming from Gangnam-gu

Rank	Region 1 (do)	Region 2 (si, gu)	Region 3 (dong, eup)
1	Seoul	Gangnam	Yeoksam 1
2	Seoul	Gangnam	Segok
3	Seoul	Gangnam	Cheongdam
4	Gyeonggi	Gwangju	Opo
5	Gyeonggi	Seongnam Sujeong	Wirye
6	Gyeonggi	Hanam	Misa 2
7	Seoul	Gangnam	Nonhyeon 2
8	Seoul	Gangnam	Nonhyeon 1
9	Seoul	Gangnam	Samseong 2
10	Seoul	Yongsan	Hannam
11	Seoul	Songpa	Munjeong 2
12	Seoul	Seocho	Yangjae 1
13	Seoul	Gangnam	Yeoksam 2
14	Seoul	Seongdong	Oksu
15	Gyeonggi	Namyangju	Dasan 1
16	Gyeonggi	Hanam	Misa 1
17	Gyeonggi	Yongin Suji	Seongbok
18	Gyeonggi	Hanam	Wirye
19	Seoul	Seocho	Seocho 4
20	Seoul	Gangnam	Apgujeong

• Suggested line #3 I Based on calls from 12am to 6am in 2019

SOCIAL INNOVATION

/

Social changes based on mobility data

Kakao Mobility
x
Korea Transportation Safety Authority

Safe Speed 5030, Slow down, and check for a pedestrian

According to OECD's Road Safety Annual Report 2017, pedestrians represent 40% of all road fatalities in Korea, ranking the highest pedestrian deaths among OECD countries. This figure is more than twice the average (18.6%) of all member countries. If we stop driving and get off a car, all of us become pedestrians. How can pedestrian deaths be reduced? The answer is in vehicle speeds. Injury severity of pedestrians increases exponentially as impact speeds rise. According to the vehicle speed based vehicle-pedestrian collision test performed by the Korea Transportation Safety Authority, if impact speeds were reduced by only 10 km/h from 60 km/h to 50 km/h, injury severity of pedestrians decreased by 20 percentage points.
OECD member countries that show a low rate of pedestrian fatalities have reduced speed limits in urban areas for the last decades: 0% in Iceland, 9.4% in Norway, 9.6% in Slovenia, 10.3% in New Zealand and 11.3% in Finland. Their figures are less than half of that of Korea.

Safe Speed 5030 implemented nationwide in 2021

The Safe Speed 5030 initiative launched in 2016 will be expanded nationwide in April 2021. It aims to lessen the severity of road accidents and decrease pedestrian deaths by reducing the speed limit of main roads in urban areas from 60 km/h to 50 km/h and setting the limit at 30 km/h on community roads including residential streets. Kakaonavi is contributing to safe driving by letting drivers know speed limits by road.

"Do lower speed limits really decrease road accidents?"
"Accidents may decrease, but will it cause a traffic jam?"

The answers were found in the data on vehicle speeds of Kakaonavi drivers.

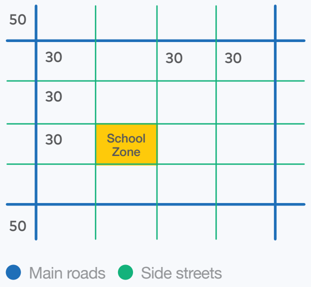
Why Kakao Mobility and KTSA put heads together

Kakaonavi measures vehicle speeds by section on most roads nationwide. In particular, it can measure them on every road with no vehicle speed detection sensors installed and collect real time data of Kakao T Taxi traveling all over the country for 24 hours. This helps Kakaonavi figure out more accurate road situations faster. Recently, Kakaonavi has been upgrading its way to measure speeds as different services including Kakao T Parking require accurate speed measurement for shorter time and sections. This laid a foundation to accurately analyze the effectiveness of "Safe Speed 5030" and provided a chance for KTSA and Kakao Mobility that have thought about safe mobility to put heads together.

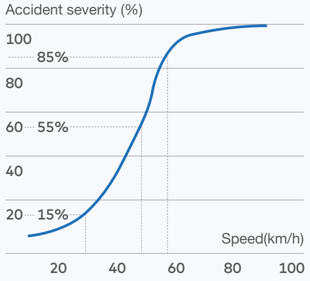
What is "Safe Speed 5030"?

The Safe Speed 5030 initiative aims to secure the safety of pedestrians and reduce pedestrian deaths in traffic accidents by reducing the speed limit of main roads in urban areas to 50 km/h or less (60 km/h if necessary for smooth traffic flow) and setting the limit at 30 km/h on community roads including residential streets where a road and a pedestrian walk are not separated and the safety of pedestrians is required

5030 concept map



Relations between speed and accident severity



Effectiveness of lower speed limits in city center areas

	Before	After	Result
Denmark	60km/h	50km/h	A 24% decrease in fatal accidents and 9% decrease in injury accidents
Germany	60km/h	50km/h	A 20% increase in traffic accidents

Reduced speed limits increase traffic flow

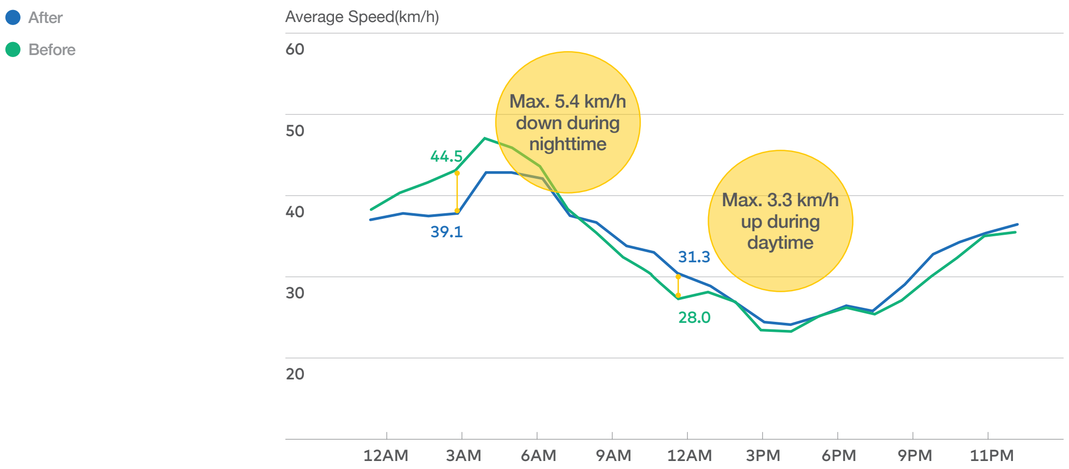
It was found that after the speed limit was reduced from 60 km/h to 50 km/h on the Avenue des Champs-Elysees, traffic flow was improved. It seems hard to understand that reduced speed limits increased traffic flow. What causes traffic congestion?

Traffic congestion not caused by car accidents or reduced lanes is called a "phantom jam". It begins when a car changes lanes, which causes the car behind that vehicle to slow down or when a car stops at traffic lights and starts again. The slowing action spreads to the traffic behind, which causes traffic congestion. This means that where a reduced speed limit is imposed, traffic congestion can be minimized as long as unnecessary lane change is avoided and vehicles move with similar speeds. Is it possible that reduced speed limits increase traffic flow in reality? It was figured out based on an analysis of travel speeds in Jongno, Seoul.

A reduced speed limit was imposed in Jongno, Seoul, in March 2018. As a result of comparing average speed before and after the implementation, it slightly decreased from 37.5 km/h to 37.2 km/h. Does this mean that the 5030 initiative was not effective? No.

It was found that the average speed decreased the most by 5.4 km/h in the late-night time period, when traffic volume is relatively low and car accident rates are high. On the contrary, traffic flow was improved and the average speed increased the most by 3.3 km/h from 8am to 11am and from 7pm to 11pm when increased traffic volume leads to congestion.

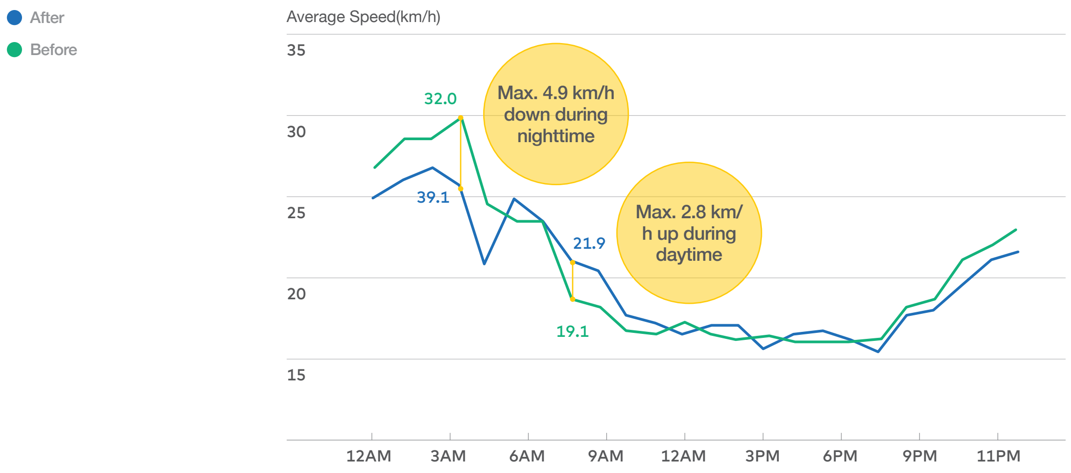
A time based change in average speed before and after 5030 in Jongno, Seoul



- Northbound section of roads in Jongno, Seoul under implementation of 5030 (Seojongno to Dongdaemun Station)
- Data analyzed from Dec. 27, 2017 to Jan. 3, 2018 for "before" data and from Dec. 26, 2018 to Jan. 2, 2019 for "after" data, except under 7 km/h of travel speed

Mareunnae-ro, Jung-gu, Seoul also showed a similar result since a reduced speed limit was imposed in February, 2019. As a result of comparing average speed before and after the implementation, it slightly decreased from 22.7 km/h to 22.3 km/h. It was found that the average speed decreased the most down by 4.9 km/h in the late-night time period, when traffic volume is relatively low and car accident rates are high. On the contrary, traffic flow was improved and the average speed increased the most by 2.8 km/h from 8am to 11am and from 7pm to 11pm when increased traffic volume leads to congestion.

A time based change in average speed before and after 5030 in Mareunnae-ro, Jung-gu, Seoul



- Southbound section of roads in Mareunnae-ro, Jung-gu, Seoul under implementation of 5030 (Gwanghui-dong Sageori to Myeongdong Cathedral intersection)
- Data analyzed before implementation from Nov. 30, 2018 to Dec. 7, 2018
- Data analyzed after implementation from Nov. 29, 2019 to Dec. 6, 2019,
- Except under 7 km/hr of travel speed

Were traffic accidents finally reduced?

Where were traffic accidents finally reduced after a reduced speed limit was imposed? According to the result of comparing traffic accidents before and after the implementation of the 5030 initiative, they decreased. In particular, a decrease in pedestrian deaths was noticeable.

Jongno, Seoul showed a 6.2% decrease in traffic accidents and a 24.1% decrease in pedestrian accidents. Deaths decreased from 3 to 1 and serious injuries decreased from 24 to 18. Accident severity was also reduced from fatal to serious and from serious to minor injuries. A decrease in pedestrian accidents was identified nationwide. The case of Yeongdo-gu, Busan where the 5030 initiative was implemented throughout the Yeongdo Island was analyzed. With the speed limit reduced from 60 km/h to 50 km/h, pedestrian accidents decreased from 3 cases to 0 on Taejong-ro and Haeyang-ro which are main roads in the island, achieving the “pedestrian accident-free” record. Cheotmajung-gil, well-known for its landscape in front of Jeonju Station, Jeonbuk, saw a 75% decrease in serious injuries from 4 to 1 with a reduced speed limit from 60 km/h to 40 km/h.

A change in pedestrian accidents before and after 5030

Street name		Speed	Accidents	Deaths	Serious injuries
Jongno, Jongno-gu, Seoul	**Before**	60	54	3	24
	After	50	41	1	18
Euljiro, Jung-gu, Seoul	**Before**	60	5	1	2
	After	50	5	0	3
Taejong-ro	**Before**	60	3	3	0
	After	50	0	0	0
Haeyang-ro, Yeongdo-gu, Busan	**Before**	60	3	3	0
	After	50	0	0	0
Cheotmajung-gil, Jeonju, Jeonbuk	**Before**	60	5	0	4
	After	40	1	0	1

- **Sejongno to Dongdaemun Station in Jongno, Seoul |** Data analyzed before implementation from Sep. 27, 2017 to Sep. 26, 2018 (1yr), after implementation from Sep. 27, 2018 to Sep. 26, 2019 (1yr)
- **City Hall Station to Dongdaemun History Park Station in Euljiro, Seoul |** Data analyzed before implementation from May 1, 2018 to Oct. 31, 2018 (6m), after implementation from May 1, 2019 to Oct. 31, 2019 (6m)
- **Yeongdodaegyo Bridge south to Taejongdae intersection in Taejong-ro, Busan |** Data analyzed before implementation from Sep. 1, 2016 to Aug. 31, 2017 (1yr), after implementation from Sep. 1, 2017 to Aug. 31, 2018 (1yr)
- **SK Busan Oil Reservoir Samgeori to Korea Maritime and Ocean Univ. Samgeri in Haeyang-ro, Busan |** Data analyzed before implementation from Sep. 1, 2016 to Aug. 31, 2017 (1yr), after implementation from Sep. 1, 2017 to Aug. 31, 2018 (1yr)
- **Myeongjugol Negoeri to Jeonju Station Plaza intersection in Cheotmajung-gil Jeonju |** Data analyzed before implementation from May 24, 2016 to May 23, 2017 (1yr), after implementation from May 24, 2017 to May 23, 2018 (1yr)

What makes us follow the speed limit?

Not all affected sections did not see a decrease in pedestrian accidents after the 5030 initiative was implemented. Not all drivers followed the speed limit either. Why did drivers not follow the speed limit? Reasons may vary: Road conditions were too good to reduce the speed; Traffic lights cooperated; and speed cameras were not installed on the road.

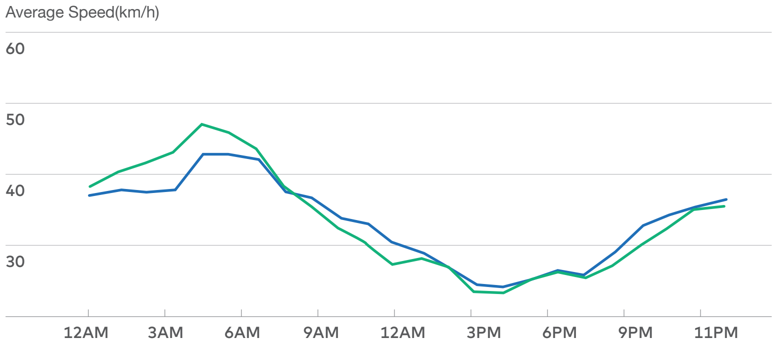
In order to examine the effect of speed cameras, the two roads with similar conditions (Jongno, Seoul and Haeundae-ro, Busan) were compared. While two speed cameras were installed on the road from Sejongno Sageori to Dongdaemun Station in Jongno, no camera was installed on Haeundae-ro from Wondong Station to Centum City Station. Did drivers reduce the speed although a speed camera was not installed?

As a result of time based average speed analysis, the average speed in Jongno from midnight to 7am significantly decreased, down the most (by 5.4km/h) at 3am. Haeundae-ro showed little change in the average speed.

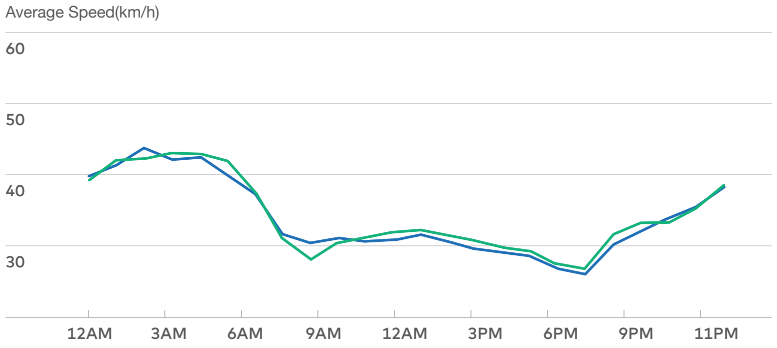
A time based change in average speed before and after 5030 in Jongno, Seoul and Haeundae-ro, Busan

● After
● Before

Sejongno Sageori to Dongdaemun Station in Jongno, Seoul



Wondong Station to Centum City Station on Haeundae-ro, Busan



Is the difference in average speed between Jongno and Haeundae attributable to a speed camera? Is it probably because of regional differences? The two-way road in Euljiro, Seoul was analyzed this time.

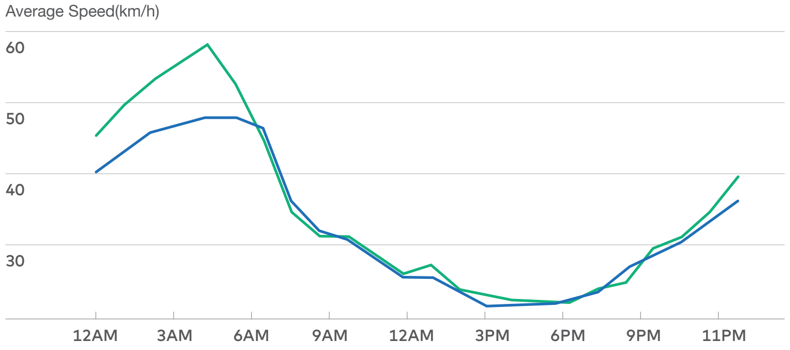
A reduced speed limit was also imposed on both sides of this road. The only difference was a speed camera. While one camera was installed on the road from Dongdaemun History Park Station to City Hall Station, no camera was installed on the road from City Hall Station to Dongdaemun History Park Station.

As a result of a time based average speed analysis, the average speed on the road to City Hall Stationwith a speed camera decreased the most by 8.6 km/h. However, it only decreased by 3.2 km/h on the road to Dongdaemun History Park Station where there is no speed camera.

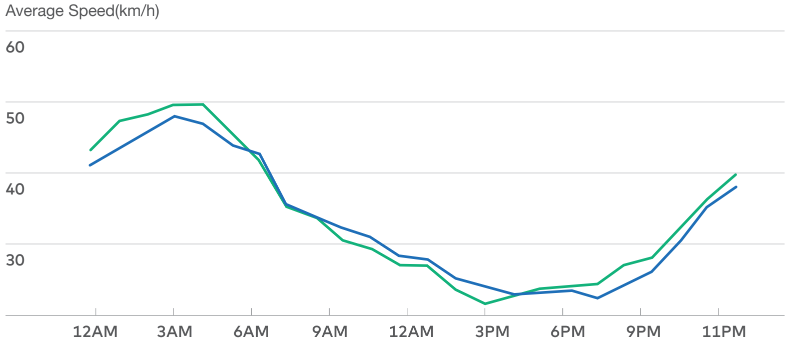
A time based change in average speed before and after 5030 on the two-way road in Euljiro, Seoul

● After
● Before

From Dongdaemun History Park Station to City Hall Station in Euljiro, Seoul



From City Hall Station to Dongdaemun History Park Station in Euljiro, Seoul



- Data analyzed before implementation from Dec. 27, 2017 to Jan. 3, 2019 (1w), after implementation from Dec. 26, 2018 to Jan. 2, 2019 (1w)
- Data analyzed before implementation from May 13, 2019 to May 20, 2019 (1w) after implementation from May 11, 2020 to May 18, 2020 (1w)

How would a driver follow the speed limit without navigation?

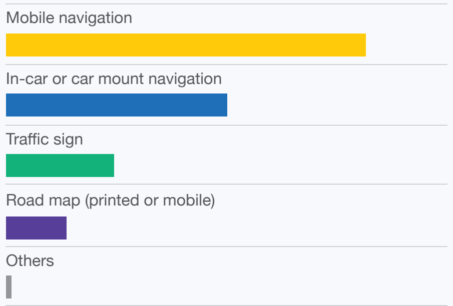
When navigation was not common, road map books were in cars and drivers looked at the map while driving. They checked road signs to see if he was in the right direction and felt relaxed. When they went someplace where they have never been to, many of them asked someone on the street for directions.

As smartphones become popular, mobile navigation services like Kakaonavi are enjoying their popularity. According to the analysis by the Korea Transportation Safety Authority, 74% of drivers were using mobile navigation services like Kakaonavi for driving directions.

When they were asked about how they checked the speed limit, 74% of drivers replied that they check the speed limit by watching the screen and listening to the voice instructions from navigation. Only 25% responded that they look at traffic signs on the road.

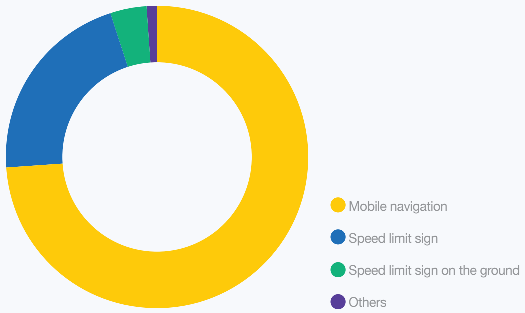
How to get directions and check speed limits

How do you usually get driving directions?



Response	No. of respondents	Percentage
Mobile navigation	2,909	74%
In-car / car mount navigation	1,951	50%
Traffic sign	906	23%
Road map (printed or mobile)	346	9%
Others	17	0%

Which of the following affects your speed the most?



Response	No. of respondents	Percentage
Mobile navigation / voice guidance	2,898	74%
Speed limit sign	819	21%
Speed limit sign on the ground	170	4%
Others	35	1%

- 3,922 people who drive a car regularly or irregularly participated online survey conducted from Jul. 15 to 26, 2020 (12 days)

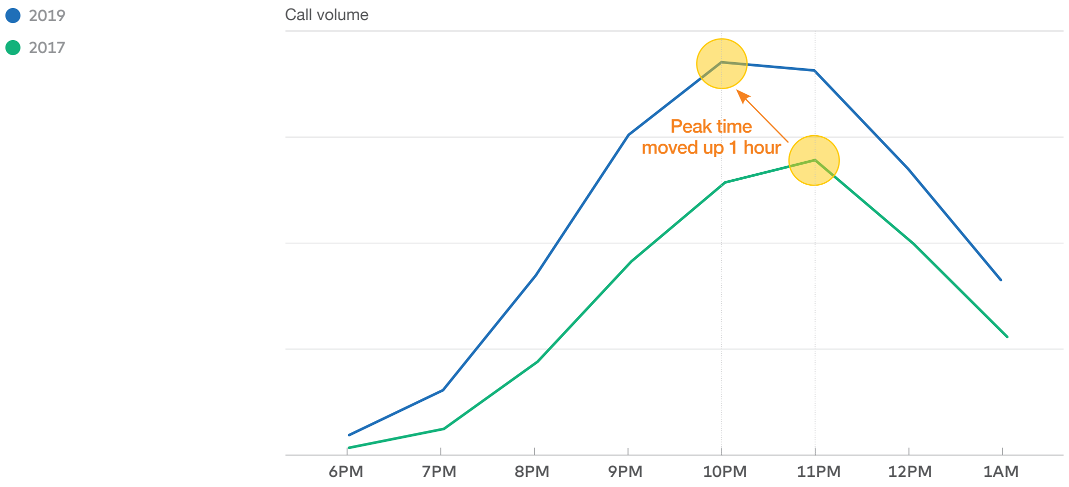
How the 52-hour workweek has changed drinking culture for the last two years

It has been two years since the 52-hour workweek was introduced. It depends on corporate culture, but it has definitely made a change in being forced to work overtime and join company dinner. Workers are enjoying their evening for themselves although they are unfamiliar with the change. How did such a change affect drinking culture? Let's take a look at the Kakao T Driver call trend.

Earlier call time

Most companies used the slogan "Company dinner is 119". This means that with one (1) type of alcoholic drink and one (1) round of dinner, company dinner will wrap up before 9pm. The previous virtue of excessive drinking throughout the night is almost gone. Probably because of such change, peak time of Kakao T Driver was moved up an hour to 10pm from 11pm in 2017.

Call time trend of Kakao T Driver

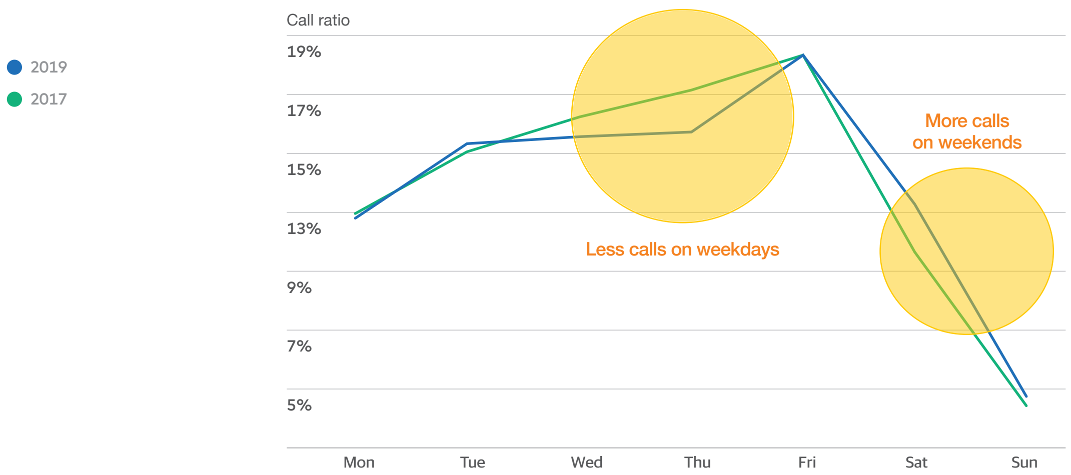


- Call time trend based on calls made on Kakao T Driver

Drink more on weekends than on weekdays

What days of the week showed the most calls made on Kakao T Driver? As anyone can anticipate, it was Friday, closely followed by Thursday. People usually drink with friends on Thursday and Friday. A certain survey showed that the most company dinner was scheduled on Thursday and Friday. It is safe to say that people drink on Thursday and Friday in Korea more than any other days of the week. As it was also proven in the number of calls on Kakao T Driver, it was the highest on Thursday and Friday. However, if you take a closer look, a call trend can be identified. The call ratio of Thursday gradually decreased in 2019, a 1.5 percentage point decrease from 2017. On the contrary, the call ratio showed a 2 percentage point increase on weekends (Friday to Sunday). Is a decrease in the number of calls on Thursday attributable to the 52-hour workweek? Since COVID-19 has made a huge change in our daily lives, Kakao Mobility is paying attention to how the call trend will develop

Call trend on Kakao T Driver by days of the week



• A change in peak time by days of the week I Based on calls made on Kakao T Driver

A change in the map of bars in Seoul based on designated drivers call data

There is a saying “Ten years make an epoch.” This is also applied to commercial districts. In some cases, this year, people rarely go to where they have frequently visited last year. Some districts rise and others sink every year. It has been 4 years since Kakao T Driver was launched. Let’s see a change in the map of bars in Seoul based on call data.

Top call locations in Seoul on Kakao T Driver

Rank	2017	2019	Change
1	Yeoksam 1	Yeoksam 1	-
2	Yeouido	Cheongdam	+1
3	Cheongdam	Yeouido	-1
4	Nonhyeon 2	Apgujeong	+2
5	Seogyo	Nonhyeon 2	-1
6	Apgujeong	Seogyo	-1
7	Seocho 3	Hannam	+3
8	Nonhyeon 1	Nonhyeon 1	-
9	Sinsa	Sinsa	-
10	Hannam	Samseong 1	+2
11	Yangjae	Seocho 3	-4
12	Samseong 1	Gayang 1	New
13	Gasan	Yangjae 2	-2
14	Jongno 1,2,3,4-dong	Jongno 1,2,3,4-dong	-
15	Yangjae 1	Gasan	-2
16	Seocho 2	Sangam	+4
17	Guro 3	Samseong 2	+1
18	Samseong 2	Seocho 2	-2
19	Myeongdong	Munjeong 2	New
20	Sangam	Yangjae 1	-5

Rising Apgujeong and calm Hannam

In the late 90s, the Orange Gang went riding in foregn cars on Rodeo Street in Apgujeong. Until the early 2000s, Apgujeong was the best known commercial district filled with hip spots and stylish people. However, since the global financial crisis in the late 2000s, it slumped down and handed over its title to another place as a hip place. However, Apgujeong is back. As local business communities have made an effort and unique cafes and bars are coming back, people are gathering in Apgujeong again. Its call ranking rose from 6th in 2017 to 4th in 2019. Hannam is a traditional place of wealth. It has unique calmness and luxuriousness. From Geumho and Oksu to Dokseodang-ro, new bars and restaurants are attracting more people. Its ranking rose by 3 notches from 10th to 7th.

Magok New Town with major companies

As major companies have been moving to Magok New Town since 2018, Kakao T Driver calls have sharply increased in its neighborhood Gayang 1-dong and Sangam-dong. This shows that companies and drinking are closely related.

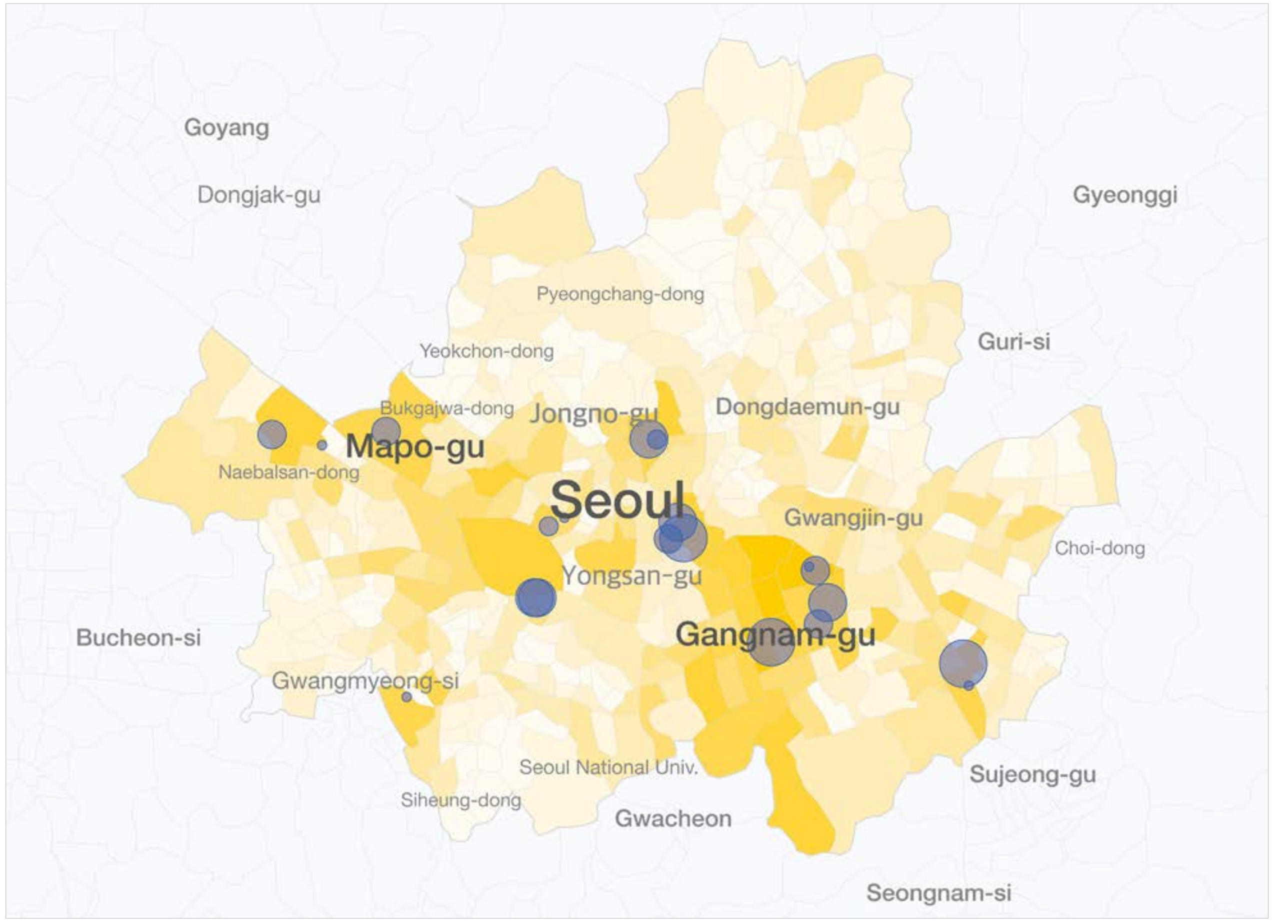
• Top 20 call locations I Based on Kakao T Driver calls

Map of bars in Seoul for 2019

Kakao Mobility prepared a map of bars in Seoul based on call data from Kakao T Driver. The call ratios were high in traditional business districts including Gangnam, Jongno and Yeouido. Central areas of entertainment like Itaewon and Hongdae also showed lots of calls.

Top 20 departures are also listed. You can recognize hip bars right away. Hannam-dong Public Parking Lot in Itaewon ranked 1st, followed by Grand Hyatt Seoul (6th) and Hamilton Hotel (12th).This showed how popular Itaewon is. Fish markets were among top 5 rankers including Garak Mall Raw Fish Center and Noryangjin Fish Market Parking Lot. Many city center areas like Gangnam and Myeongdong were in the list. It was interesting that two departures in Gayang 1-dong, Gangseo-gu, were also in the list.

Regional call distribution in Seoul


Goyang
Dongjak-gu
Gyeonggi
Pyeongchang-dong
Yeokchon-dong
Guri-si
Bukgajwa-dong
Jongno-gu
Dongdaemun-gu
Mapo-gu
Naebalsan-dong
Seoul
Gwangjin-gu
Choi-dong
Yongsan-gu
Bucheon-si
Gangnam-gu
Gwangmyeong-si
Seoul National Univ.
Siheung-dong
Gwacheon
Sujeong-gu
Seongnam-si

Top 20 hot places in Seoul on Kakao T Driver

Rank	Departure	Region (dong, gu)
1	Hannam-dong Public Parking Lot	Hannam, Yongsan
2	Garak Mall Raw Fish Center	Garak 1, Songpa
3	Gangnam Finance Center	Yeoksam 1, Gangnam
4	Noryangjin Fish Market Parking Lot	Noryangjin 2, Dongjak
5	Noryangjin Fishery Wholesale Market	Noryangjin 2, Dongjak
6	Grand Hyatt Seoul	Hannam, Yongsan
7	Mirae Asset Center 1	Myeongdong, Jung-gu
8	Asem Tower	Samseong 1, Gangnam
9	495, Sangam-dong, Mapo-gu, Seoul	Sangam, Mapo
10	Hotel Riviera Cheongdam	Cheongdam, Gangnam
11	POSCO Center	Daechi 4, Gangnam
12	Hamilton Hotel	Itaewon 1, Yongsan
13	Doosan the Land Park	Gayang 1, Gangseo
14	Signature Tower	Myeongdong, Jung-gu
15	Mapo Public Parking Lot	Yonggang, Mapo
16	Dohwa-dong Community Service Center	Dohwa, Mapo
17	Gangseo Hangang Xi Tower	Gayang 1, Gangseo
18	Daeryung Post Tower 6	Gasan, Geumcheon
19	Munjeong Hyundai Knowledge Industry Center	Munjeong 2, Songpa
20	Saebyeok Jib Cheongdam	Cheongdam, Gangnam

- Regional call distribution in Seoul I Based on Kakao T Driver calls and departures in 2019
- Top 20 hot places in Seoul on Kakao T Driver I Based on Kakao T Driver calls and departures in 2019

What is the difference between taxis in New York and in Seoul?

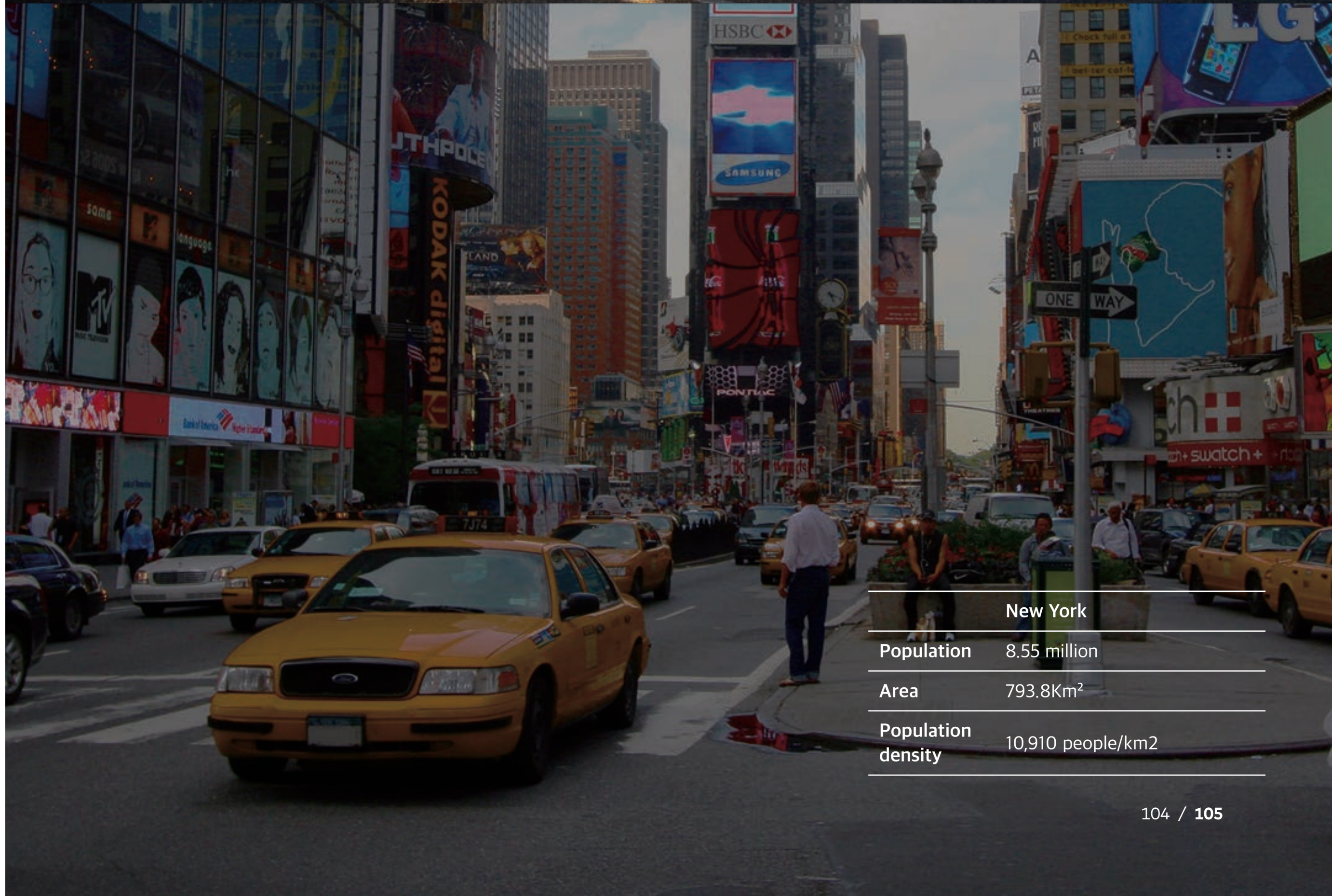
The mobility industry is developing into different forms depending on systematic environments of each country. Taxis are one of the major passenger transportation services that have developed into different forms by region. While the taxi business took a responsibility for point-to-point transportation or regional transportation, it is common that regardless of regions, it is now based on on-demand mobility platforms. However, detailed development paths are different in each city.

New York and Seoul were compared in order to look into diversity and characteristics of the mobility market. New York is an origin of today's taxi market and one of the biggest markets of TNC or ride sharing service providers like Uber and Lyft. The platform transport business (Type 1), one of the transport platform businesses in Korea that are expected to grow with the revised Passenger Transport Service Act in March 2020, is similar to TNC in the United States. New York's situations help predict the future of our mobility industry. How do New York and Korea look from the perspective of mobility data?

New York City (hereinafter "New York") is the center of global economy in the northeastern United States. It consists of five boroughs: Manhattan, Brooklyn, Bronx, Queens and Staten Island with its area of 793.8 km2. Its population is 8.55 million as of 2020, the most populous city in the United States. Seoul City (hereinafter "Seoul") has its area of 605.2 km2 and population is 10.01 million (9.73 million Koreans and 280,000 foreigners). Seoul's area is 30% smaller than New York's and New York's population is 15% less than Seoul's.

Today's taxi system was established in New York. The local government has halted the issuance of new taxi licenses and controlled fare systems by introducing strong regulations in order to recover the taxi market that was on the verge of collapse right after the Great Depression in the 1930s. New York's taxi regulatory system has developed into the "QEE"(Quality, Quantity & Economic Control) framework that regulates taxi quality, quantity and price. This has become the standard of taxi regulations in major cities including Seoul.

	Seoul
Population	10.01 million (incl. foreigners)
Area	605.2Km^2
Population density	6,546 people/km2



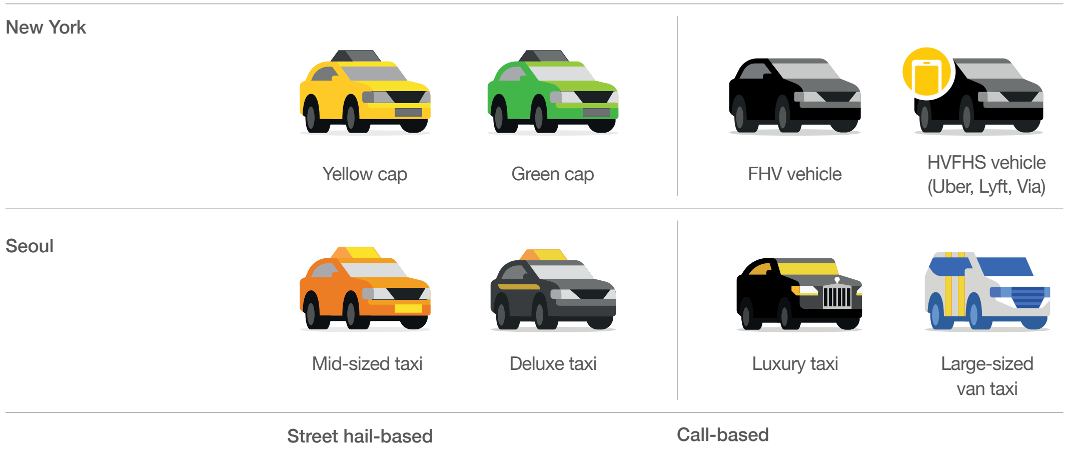
	New York
Population	8.55 million
Area	793.8Km^2
Population density	10,910 people/km2

Ride-sharing in New York and mid-size taxis in Seoul

New York's taxi market consists of regular taxis and FHVs (For-hire vehicles). With taximeters like in Seoul, they provide passenger transport services and get around to search for a passenger. New York has two types of taxis. One of them is traditional yellow cabs that represent New York. In 2013, boro taxis were newly introduced which were allowed to pick up passengers in some areas of northern Manhattan and outer boroughs. The color of boro taxis is apple green, so they are called green cabs. As of 2019, there are 13,587 yellow cabs and 3,004 green cabs in New York. Both taxis are available by street hails or calls like in Korea.

FHVs provide call-based or pre-arranged transportation services. FHVs include Black Cars, Luxury Limousines, Liveries (Community Cars) and more with no designated color for each class. Street hails are not allowed for FHVs. They have no taximeters, so pre-arranged or flat rates are charged for services.

Major taxi types in New York and Seoul



A majority of FHVs are ride-sharing cars like Uber in New York. The number of FHVs was about 40,000, but reached 116,449 in 2019, an almost three times increase. This is mainly attributable to rapidly expanded car-sharing services. Ride sharing cars like Uber are under regulations on Black Cars that are registered under call taxi operators or call taxi associations. As of 2019, 88.7% of FHVs were Black Cars.

Ride-sharing service providers like Uber and Lyft are allowed to operate as HVFHS (High Volume For-hire Services). In order to separately regulate large FHV bases that match 10,000 or more calls a day, the New York City government recently introduced HVFHS in 2018. On the contrary, most cities and states including New York State stipulated TNC (Transportation Network Company) as a new type of transport service provider under relevant laws and allowed ride-sharing companies to legally provide their services. According to some exceptions of New York State Laws, ride-sharing services are under regulations on existing taxis.

Population to taxi ratio in New York is over twice that of Seoul's

There are exceptionally many ride-sharing cars compared to traditional taxis in New York. This is contrary to Seoul where a majority of taxis are hail-based mid-sized taxis. The number of yellow and green taxis combined is only 16,591 cars as of 2019. Considering that the number of mid-sized and deluxe taxis combined is 67,432 cars in Seoul, New York's taxis are just one fourth of Seoul's.

However, the number of FHVs including Uber and Lyft reaches 116,449 cars that operate based on calls. This is over 70 times the number of call-based taxis in Seoul amounting to 922 cars ((luxury, large-sized passenger vehicles and vans). Total number of street hail-based and call-based taxis per 1,000 people is 15.6 cars in New York and 6.8 cars in Seoul. New York's taxis are more than twice that of Seoul's.

No. of taxis by operation type in New York and Seoul

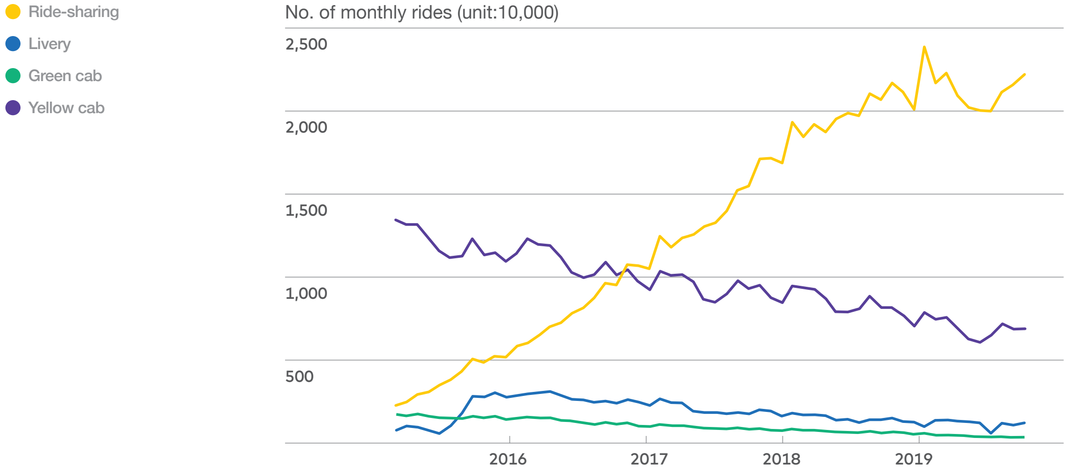
	New York	Seoul
Street hail-based	16,591	67,432
Call-based	116,449	922
Total number of taxis (incl. FHV)	133,040	68,354
No. of taxis per 1,000 people	15.6	6.8

• No. of taxis by operation type in New York and Seoul |
For street hail-based taxis, it is the number of yellow and green cabs combined in New York and the number of mid-sized and deluxe taxis combined in Seoul. For call-based taxis, it is the number of FHVs in New York and the number of luxury, large-sized passenger vehicles and vans combined in Seoul.

Uber and Lyft are all the rage in New York

It's been a while since ride-sharing services were established in New York's taxi market. Ride-sharing service that started to grow in the early 2010s exceeded the number of monthly rides in yellow cabs in December 2016, and since then the gap has widened. The service that was less than 10 years old turned the tables on 100-year old yellow cabs. As of December 2019 before the coronavirus affected the market, the number of ride-sharing service rides recorded 22.24 million rides, more than three times the number of yellow cab rides (6.84 rides).

New York taxi and ride-sharing service use trend

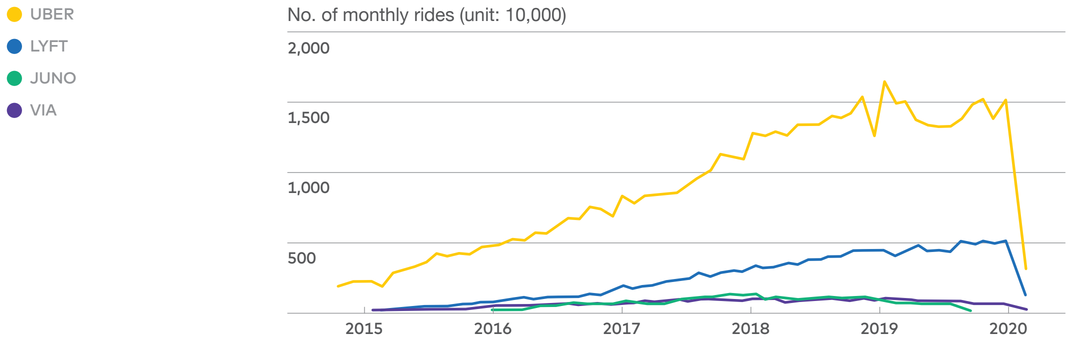


As Uber takes the lead in New York's ride-sharing service market, the number two Lyft is following. As of December 2019, Uber's market share reached approximately 72.4%, followed by Lyft (24.4%) and Via (about 3.2%). Juno shut down its operations in New York in November 2019 as owner Gett signed a strategic partnership with Lyft.

Hard hit by COVID-19, New York's ride-sharing companies are recovering. In February 2020, the number of daily rides on average reached 543,000 for Uber and 184,000 for Lyft respectively. However, in April when COVID-19 was declared a pandemic and lockdown measures were taken, it sharply dropped to 103,000 and 38,000 respectively. As the economy resumed gradually after May, the number of ride sharing service rides has been recovering from the bottom in April. However, as there is still a concern that COVID-19 will spread again, it remains to be seen whether the recovery will continue.

• New York taxi and ride-shaing service use trend |
Source: NYC Taxi & Limousine Commission, based on number of monthly rides

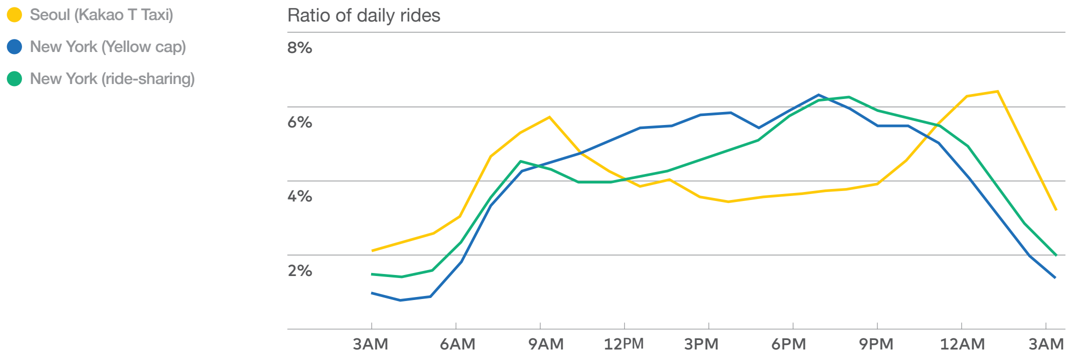
Ride-sharing service use trend by provider



Taxi peak hours are different between New York and Seoul

Taxi use patterns were significantly different in New York and Seoul. While relatively more taxi riders used services from night to dawn in Seoul, in New York taxi use was noticeable from daytime to evening. Taxi use peaked in Seoul around 8am on weekdays and 9am on weekends in the morning and around midnight both on weekdays and on weekends at night. In New York, ride-sharing services showed a small peak around 8am but 7pm was the most intensive peak time. Yellow cabs showed a peak around 4pm, instead of during morning rush hours, before 6pm - during evening rush hours - saw use hit its most intense time. Since New York is the world's financial center, many people go to work before the U.S stock market opens, and it seems that there are many yellow cab riders at the center of Manhattan around 4pm right after the market closes. Compared to New York, it seems that there are relatively more people in Seoul that spend time hanging out with friends or working until late night.

Taxi use pattern comparison in Seoul and New York



• Ride-sharing service use trend by provider | Source: NYC Taxi & Limousine Commission, based on number of monthly rides
• Taxi use pattern comparison in Seoul and New York | Source: Kakao mobility and NYC Taxi & Limousine Commission, based on December 2019

Taxi use intensified at the center areas both in Seoul and in New York

Ride-sharing services have improved access to outer boroughs

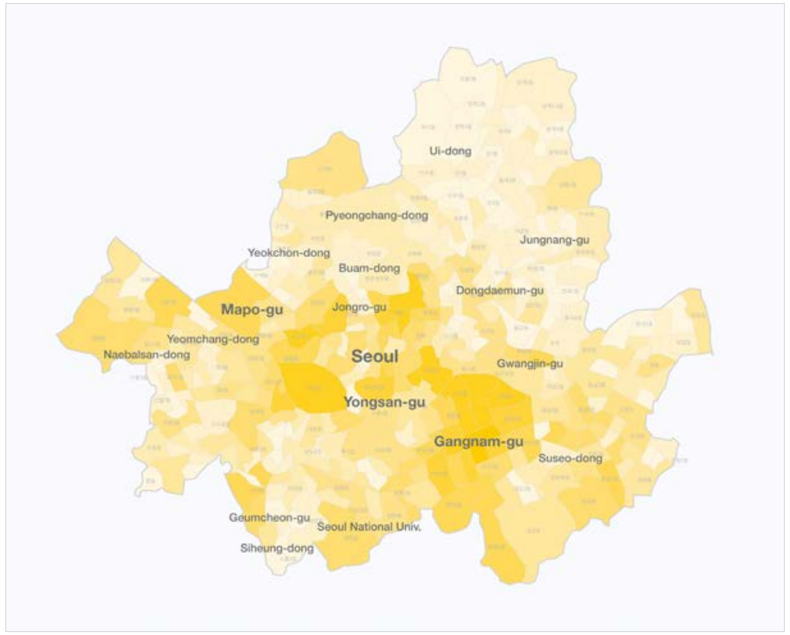
It was found that taxis are key transportation at the center areas of any cities. Seoul showed a high call ratio at central business districts including Jung-gu and Jongno-gu and at top three business districts including Yeouido and Gangnam and around Itaewon and Hongdae at night. Most pickup locations for taxi and ride-sharing services in New York were in central Manhattan. LaGuardia Airport and JFK Airport near Manhattan saw high demand for taxis.

Meanwhile, ride-sharing service pickup location distribution was quite different from regular taxis in New York . While most pickup locations for yellow cabs were in Manhattan, outer boroughs showed relatively high use of ride-sharing services. It is because street hail-based yellow cabs operate mainly at urban centers where there are lots of passengers. As for call based ride-sharing services, however, demand distribution can be relatively wide. In 2013, the New York City government introduced “green cabs” for citizen’s convenience in outer boroughs. In fact, ride-sharing services are responsible for most demands in outer boroughs.

Taxi pickup location distribution in Seoul

Frequency of taxi use

Low High

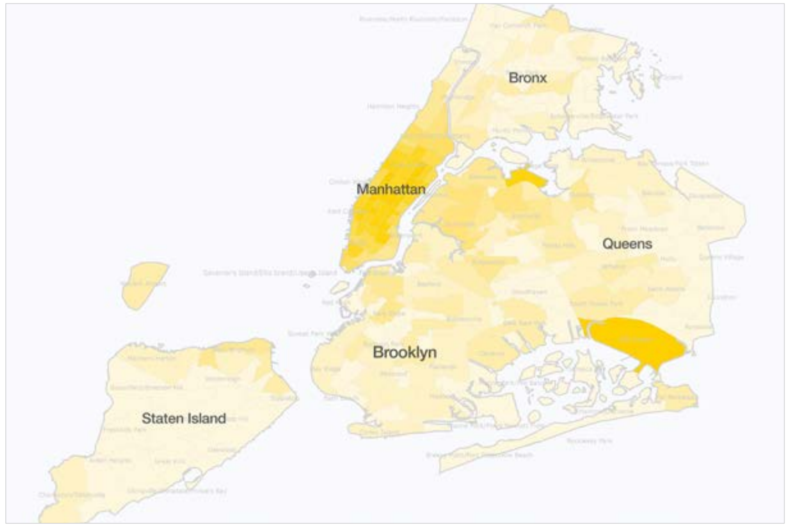

Ui-dong
Pyeongchang-dong
Jungnang-gu
Yeokchon-dong
Buam-dong
Dongdaemun-gu
Mapo-gu
Jongro-gu
Yeomchang-dong
Naebalsan-dong
Seoul
Gwangjin-gu
Yongsan-gu
Gangnam-gu
Suseo-dong
Geumcheon-gu
Seoul National Univ.
Siheung-dong

Taxi and ride-sharing pickup location distribution in New York

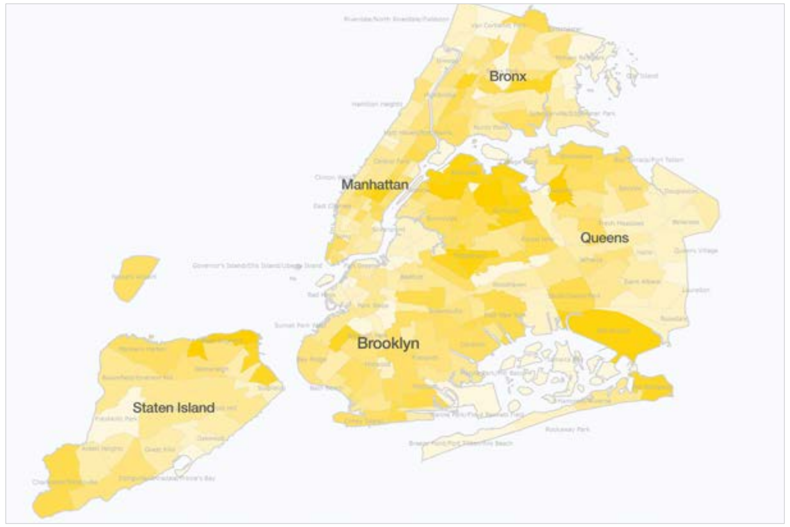
Frequency of taxi use

Low High

New York I Based on taxi rides and ride-sharing vehicle rides


Bronx
Manhattan
Queens
Brooklyn
Staten Island

New York I Based on vehicle rides


Bronx
Manhattan
Queens
Brooklyn
Staten Island

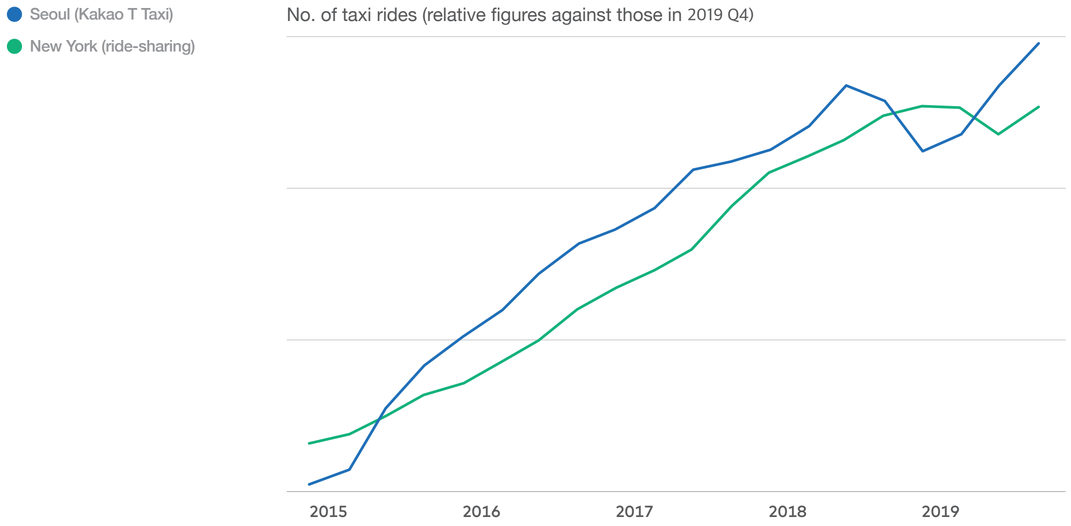
• Taxi pickup location distribution in Seoul and Taxi and ride-sharing pickup location distribution in New York Based on December 2019

Call-based taxi use in Seoul exceeded ride-sharing service use in New York

While ride-sharing services have been developed in New York, taxi-hailing services like Kakao T Taxi are more popular in Seoul. The number of Kakao T Taxi rides in Seoul exceeded ride-sharing vehicle rides in New York. Except for the first several months of Kakao T Taxi launch and in the first half of 2019 when taxi demand slowed down due to the increased taxi fares, it was found that new mobility services grew faster in Seoul than in New York. This result suggests that a growth potential of the mobility market in Seoul compares quite well with New York's.

New York showed stable growth of ride-sharing service since its introduction. As California took the lead to allow TNC to legally operate in 2013, ride-sharing services became one of the key transportations in major cities in the United States. In New York, the ride-sharing service market exceeded the 100-year-old traditional taxi market three years after ride-sharing services were legally allowed. As Korea recently established systems for transport platform businesses - Type 1 for platform transport business, Type 2 for platform franchise business and Type 3 for platform brokerage business - more different mobility services are expected to enhance their quantitative and qualitative growth.

Mobility service use trend in Seoul and New York



• Mobility service use trend in Seoul and New York I Based on quarterly cases of rides

CHAPTER 3

LIFE INNOVATION

/Mobility service changing our daily lives

/Our daily lives revealed by data

LIFE INNOVATION

/

Mobility service changing our daily lives

One year since the birth of Kakao T Bike, now a part of our lives

Kakao T Bike was introduced just an year ago, in March last year. Kakao Mobility just spent a full year with Kakao T Bike recently, going through all four seasons. The service opened in just two regions but it quickly expanded to four, and it is continuously being expanded thanks to the local government's interest and people who were in need of new transportation. Only in its second year of service, Kakao T Bike has more records and episodes than a 10-year-old service.
The year 2020 started with an unprecedented challenge, COVID-19. People went on with social distancing while dealing with a legendary rainy season in the summer. Fortunately, not everything was a disaster and we could gain valuable experience for expanding our service.

Bike fever hitting hard with the advent of COVID-19

COVID-19 stopped people from going from one place to another. Those who were busy going to school or work everyday stayed in their homes. With the emergence of a new virus, people chose to stay at home to be safe. But, they could not stay home forever. As you could see from the new word, 'Corona Blue,' staying at home for an undetermined period of time made people depressed. People soon began to seek a new way of transportation.

The need for new transportation was expressed by demand for bicycles. Bicycles have always been there, but they suddenly got a new spotlight. Bicycles were a perfect ride that met the requirement for social distancing. And, people could relieve their stress by riding them. Immediately the need for bicycles has literally "exploded". Some people bought bicycles or electric scooters, but others quickly chose easy to ride shared electric bicycles very rapidly. The number of Kakao T Bike users have exploded as well.

The usage rate of Kakao T Bike has increased in all regions. During April to July, the average monthly usage rate per bike increased by 27 percent and the number of users who completed the ride increased by 35 percent compared to the same period last year. This is not just because we have increased the number of bikes, but it is because the usage rate of all bikes has increased

User growth rate

35%

Usage growth rate per bike

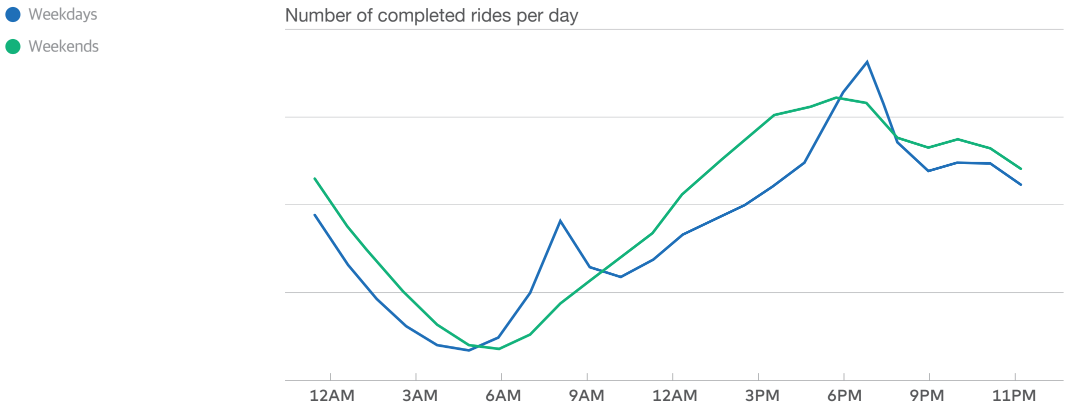
27%

April to July 2020, year on year, no. of completed rides

Kakao T Bike now a part of our lives

With the massive love it is getting, Kakao T Bike is now becoming a part of our lives. Daily usage patterns seemed similar to that of last year, creating peak hours between 7 to 9am and 5 to 7pm. We could again see a peak hour on weekends, around 3 to 4pm. High usage rate is also shown in late night hours around midnight.

Usage pattern of Kakao T Bike during weekdays and weekends



• Usage pattern of Kakao T Bike during weekdays and weekends | Based on completed rides

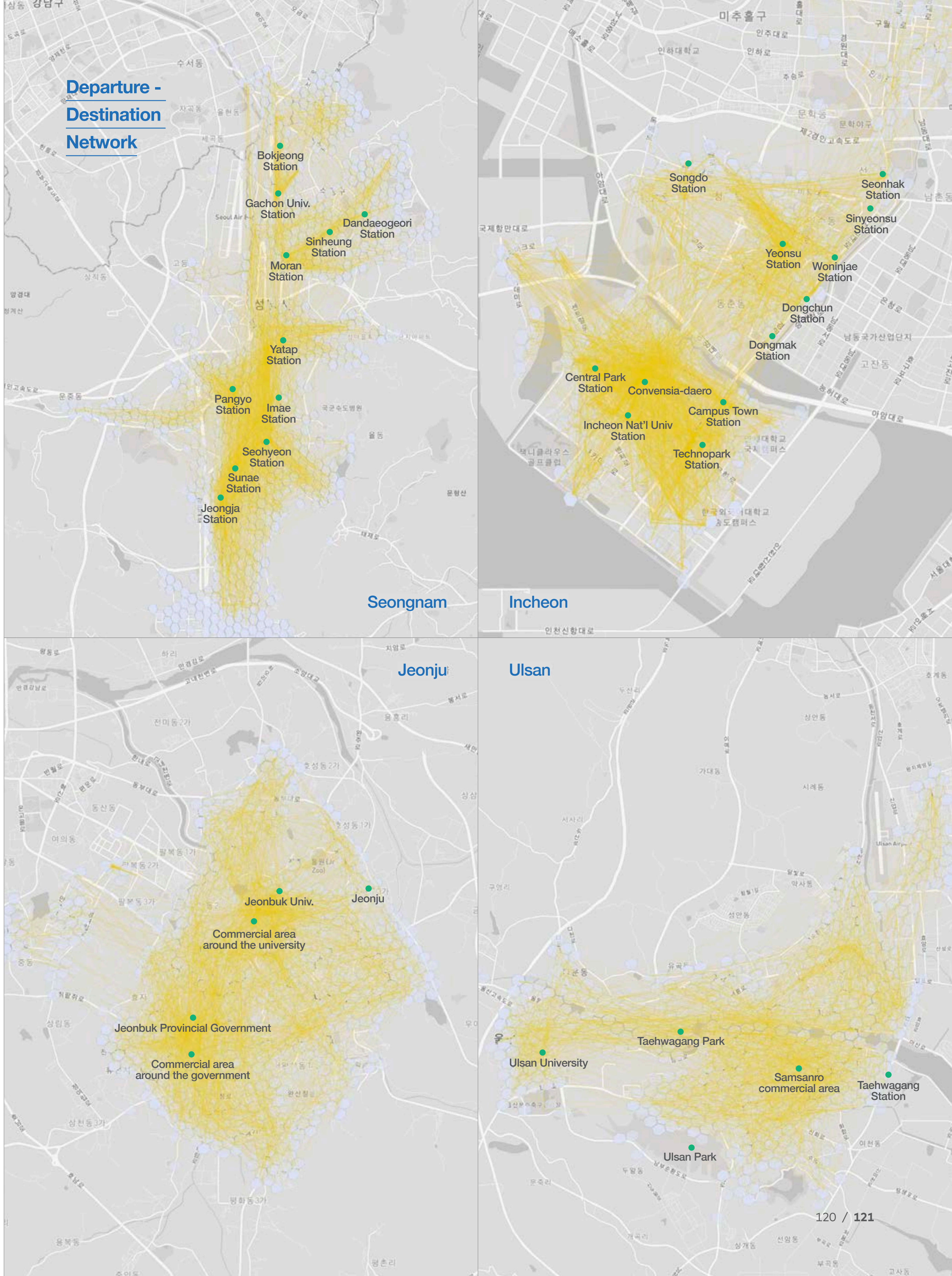
Last mile vs "Just" mile

Personal mobility(personal transportation) like Kakao T Bike has been considered as a “last mile” transportation that takes you from automobiles or subways to the final destination. However, there were some new patterns in certain service areas - usage patterns that could not be explained with the '“last mile” theory.

Kakao T Bike first started its service in Seongnam and Incheon but expanded to Jeonju and Ulsan in July and September 2019, respectively. When you look at the usage pattern in Seongnam and Incheon, you can see that Kakao T Bike is being used as a “last mile” transportation to subway stations as both cities have highly complex subway networks. Bikes were intensively used around subway stations and bike roads (Tancheon and more) in both cities.

Meanwhile, Jeonju and Ulsan showed somewhat different patterns. There are no subway networks in these cities and Kakao T Bike moved around universities and major governmental, business, and commercial districts. This indicates that Kakao T Bike is not just a supplementary transportation, but a main one for some citizens. For regions with insufficient mass transportation, shared transportation services like Kakao T Bike could be a key to solving their transportation issues.

Departure - Destination Network


Bokjeong Station
Gachon Univ. Station
Dandaeogeori Station
Sinheung Station
Moran Station
Yatap Station
Pangyo Station
Imae Station
Seohyeon Station
Sunae Station
Jeongja Station
Seongnam
Songdo Station
Seonhak Station
Sinyeonsu Station
Yeonsu Station
Woninjae Station
Dongchun Station
Dongmak Station
Central Park Station
Convensia-daero
Campus Town Station
Incheon Nat'l Univ Station
Technopark Station
Incheon
Jeonju
Jeonbuk Univ.
Jeonju
Commercial area around the university
Jeonbuk Provincial Government
Commercial area around the government
Ulsan
Taehwagang Park
Ulsan University
Samsanro commercial area
Taehwagang Station
Ulsan Park

Kakao T Bike and its faithful customers

Weather affects cycling. It is not easy to ride a bike during cold weather when the road is frozen and the wind is killing you. Nevertheless, there are these faithful cyclers who relentlessly take their bikes to the road. And when the spring comes and the weather gets warm, those who stopped cycling during the winter season reappear and the retention rate spikes up. This is very inspiring, as with any product or service a customer retention rate is just as important as an acquisition rate.

Kakao T Bike is creating a strong fan base just within a year. Top 10% of frequent users pay almost 51% of the total fare, indicating the high usage rate of faithful customers. If you look at the data by user segments, those who ride the bike for commuting purposes or in the early morning have 2~3 times higher possibility to be in the top 10% group. On the other hand, those who ride the bike on weekends take up the biggest portion but their possibility to be in the top 10% group is relatively low compared to other user segments. The results show that user intensity is different for each group. For example, users who ride the bike on weekends have lower intensity while users who ride the bike for commuting purposes or in the early morning have strong intensity to Kakao T Bike.

Kakao T Bike gets better and better

The 1st generation of Kakao T Bike, which was introduced in March 2019, was an electric bicycle with a smart lock attached. The 1st gen Kakao T Bike endured four seasons including rainy and snowy days, and soon a new model was needed to replace these bikes. By listening to the voice of the customers the second generation of Kakao T Bike came into the world in August 2020.

The major differences between the 1st and 2nd generation bikes were the improvement in design, range, smart lock, and ride quality. The 2nd gen was a whole new model, with many improvements added with Kakao Mobility Bike team's experience and technology. First, the 2nd gen model had Kakao Friends characters painted on the bike to increase friendliness. Second, battery performance got better so that users could ride their bikes longer. Stability of the bike has been improved, and the accuracy of GPS has been improved as well. Sometimes users could not find the bikes because a wall or a pole was blocking them, but with the recent upgrade this will not be a problem anymore and users will be able to find their bikes more easily. Also, a new feature was added to help Kakao T Bike staff easily find the bikes by making them beep. And to improve ride quality, chains, saddles and tires were upgraded.

1st generation

kakaoTbike
AA0002

Design	2 characters from Kakao Friends Ryan, Appeach
Range	About 3 hours per charge (subject to riding conditions)
Smart lock	No additional features
saddles, chains, tires	Basic saddles, hard tires

2nd generation

kakaoT bike

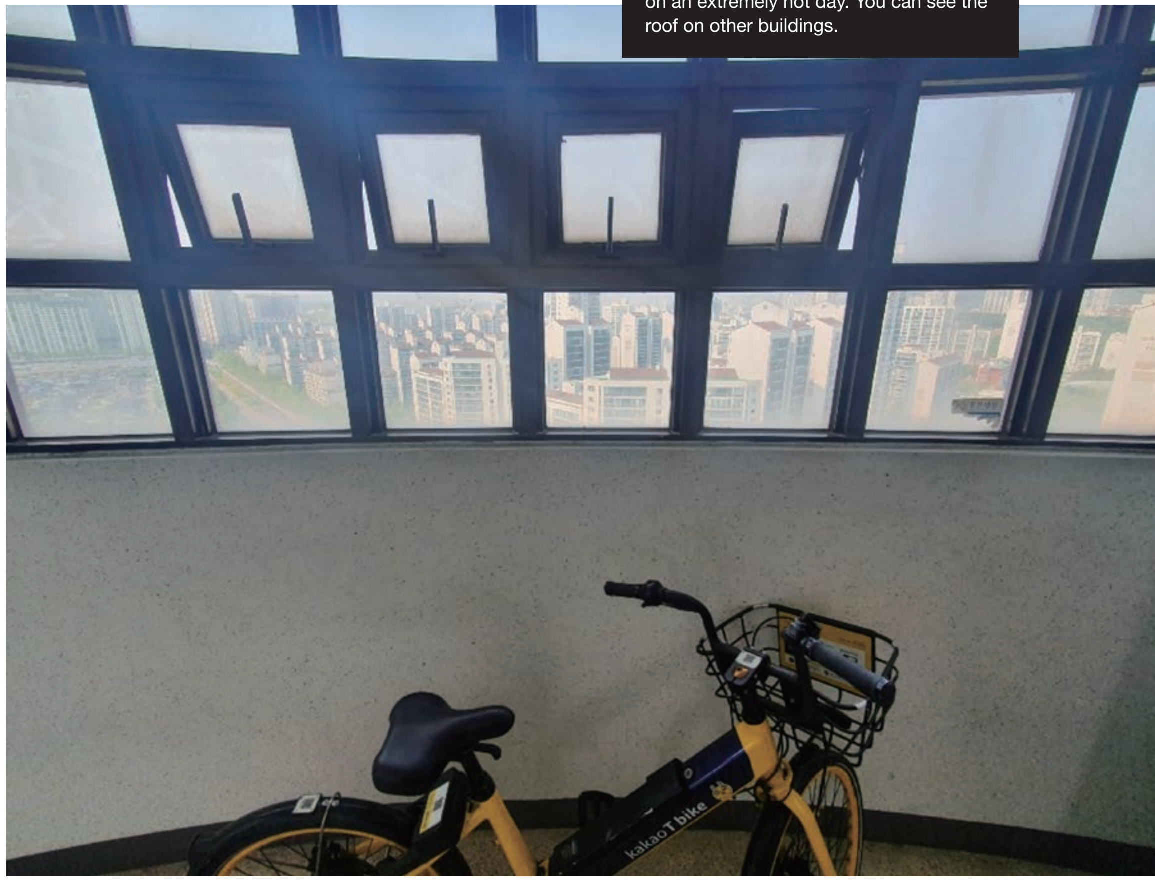
Design	5 characters from Kakao Friends Ryan, Appeach, Muzi, Tube, Jay-G
Range	About 4 hours per charge (subject to riding conditions)
Smart lock	Increased GPS accuracy, bike search feature using smart lock beep sound (increased efficiency)
saddles, chains, tires	Prevented chain fall off, improved ride quality b y using spring saddles, upgraded tires with high durability and ride quality tires

Kakao T Bike user analysis and service staff episodes

As Kakao T Bike became wildly popular in such a short period of time, so many episodes have been created. Our Kakao T Bike staff have much to share from those funny or sad episodes. Here are the pictures of most unthinkable places to find the Kakao T Bike.

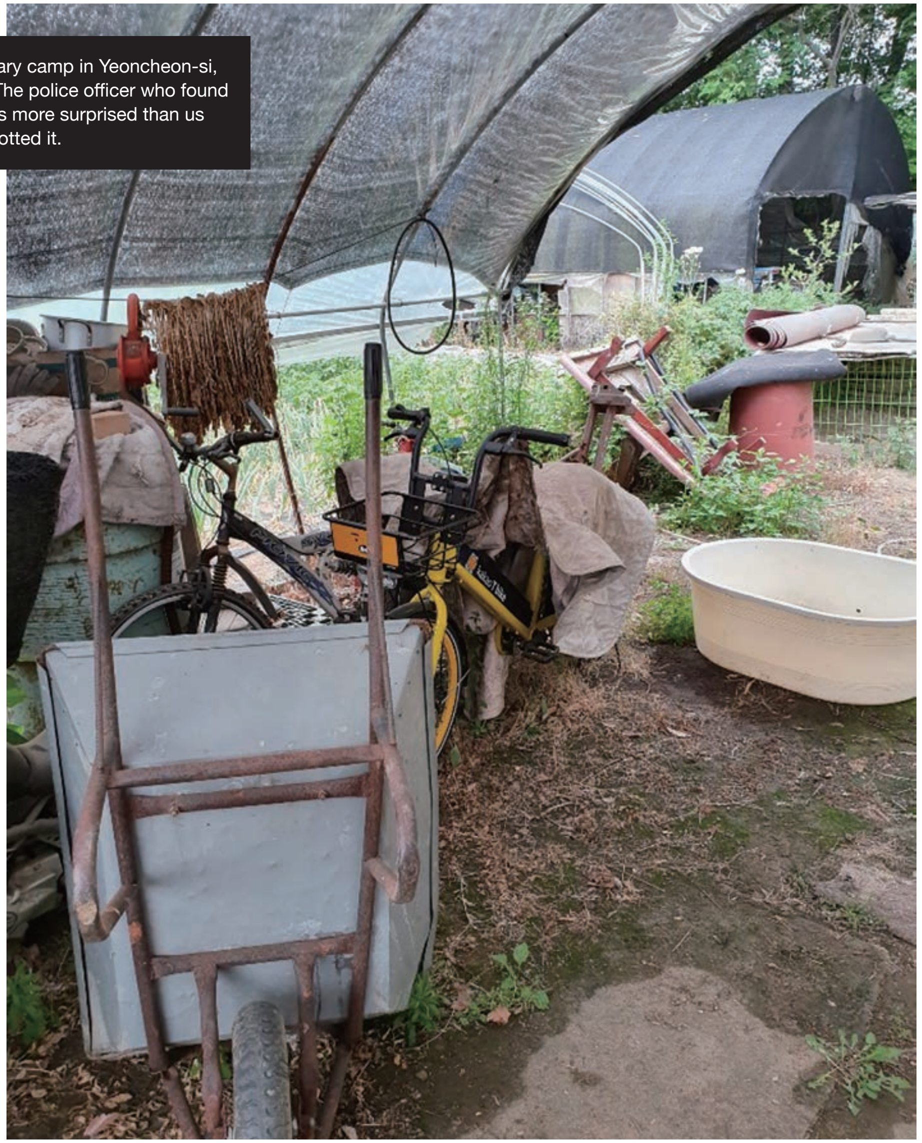
kakaoT bike

On a pedestrian bridge on a snowy day



On the 18th floor of an apartment building on an extremely hot day. You can see the roof on other buildings.

In the bushes. This is not a landscape...hide and seek!



Near a military camp in Yeoncheon-si, Gangwon. The police officer who found the bike was more surprised than us when he spotted it.

When Kakao T Parking meets Everland

In July 2020, Kakao T Parking made an appearance in Everland. With the partnership with Kakao T Parking, Everland is solving the problems of its parking infrastructure, traffic flow of entering & exiting cars, insufficient parking spaces, etc. Users can now easily pay on mobile by using the Kakao T app. On top of that, the positive brand image of Kakao is building confidence for users' experience in the parking service.

다음에 또 만나요!
주차가 필요할 땐, 카카오T주차
다음에 또 만나요!
주차가 필요할 땐, 카카오T주차

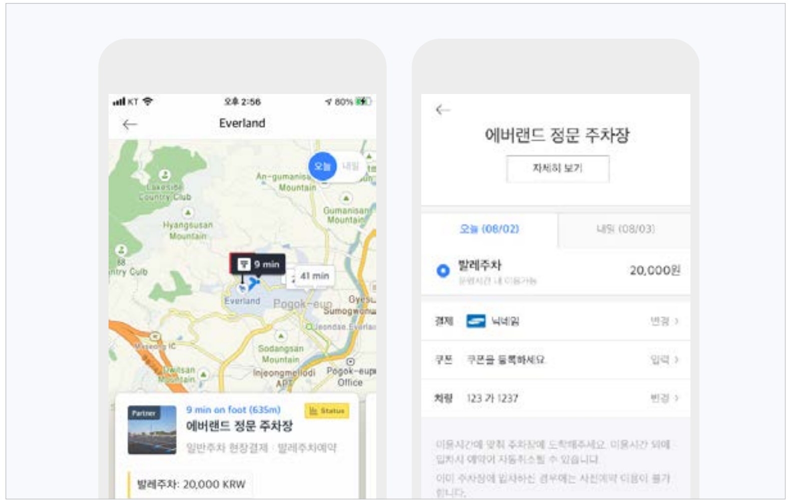
• Everland main entrance TCP (photo by Everland)

Everland parking lot got a whole new look with Kakao T Parking

Let's see how Kakao T Parking solved the parking and traffic issues. First, Kakao T Parking collaborated with Everland to change the shuttle bus route and combine all parking lots that were sporadically located. This enabled the traffic to circulate and improved the overall flow. Also, 200 parking spaces were added to the existing 1,800 to improve the overall parking experience. And Kakaonavi optimized its route according to the improved flow to guide users to the entrance as quickly as possible.

Users who wish to use the valet service in the main entrance may do so by making a reservation in the Kakao T app. When the valet user's vehicle arrives at the main entrance parking lot, the system recognizes the reservation so the user doesn't need to go through any additional payment or reservation process.

Mobility's AI technology also provides high-tech parking info. "Recommend alternative destination" feature collects real-time parking lot data and directs users to the nearest parking lot. Other features, such as "Parking space occupancy estimation graph" and "AI recommended departure time" will be launched in Kakao T and Kakaonavi app within this year.


KT
오후 2:56
80%
Everland
오늘
내일
An-gumanisan Mountain
Lakeside Country Club
Hyangsusan Mountain
Gumanisan Mountain
9 min
41 min
Everland
Pogok-eup
Sumogwon
Sodangsan Mountain
Injeongmellodi APT
Pogok-eup Office
Partner
Status
자세히 보기
변경 ›
입력 ›
변경 ›

9 min on foot (635m)
에버랜드 정문 주차장
일반주차 현장결제 · 발레주차예약
발레주차: 20,000 KRW

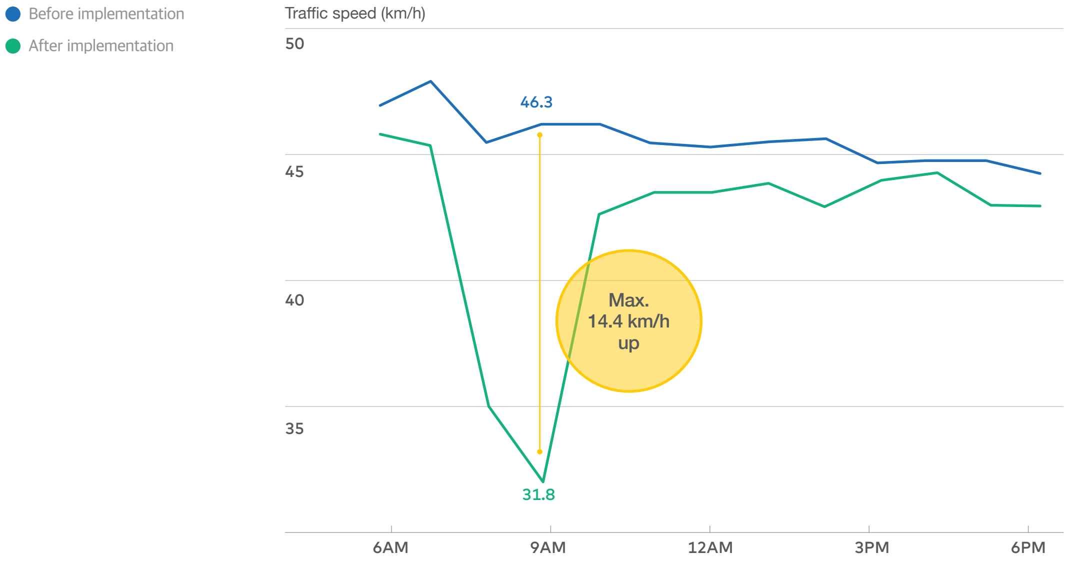
에버랜드 정문 주차장
오늘 (08/02)
내일 (08/03)
○ 발레주차 20,000원
결제 닉네임
쿠폰 쿠폰을 등록하세요
차량 123 가 1237

• Everland main entrance parking lot (photo by Everland)

Traffic flow at the entrance improved by max.14.4 km/h with Kakao T Parking

How did Kakao T Parking impact the Everland parking lot? We analyzed the traffic speed of “Everland-ro” which is a road that connects Maseong IC to Everland main entrance. By using the Kakaonavi data, we compared the before and after of Kakao T Parking. Data period was July 2020 (four weeks) and July 2019 (four weeks) during 6am to 6pm on weekends and holidays. The result showed significant improvement in traffic speed after Kakao T Parking was introduced. During the 12 hours (6am to 6pm), average traffic speed was improved by 3.4 km, from 42.3 km to 45.7 km. However, outstanding improvement was seen 1 to 2 hours before the opening time. Everland parking lot starts to fill up 1 to 2 hours before the opening time (10am), and 9am is the busiest. However, the result showed that the traffic speed during this time period was improved by 14.4 km as the parking lot became less crowded and traffic congestion was improved at the entrance.

Comparison chart of Everland traffic flow - before and after the implementation of Kakao T Parking

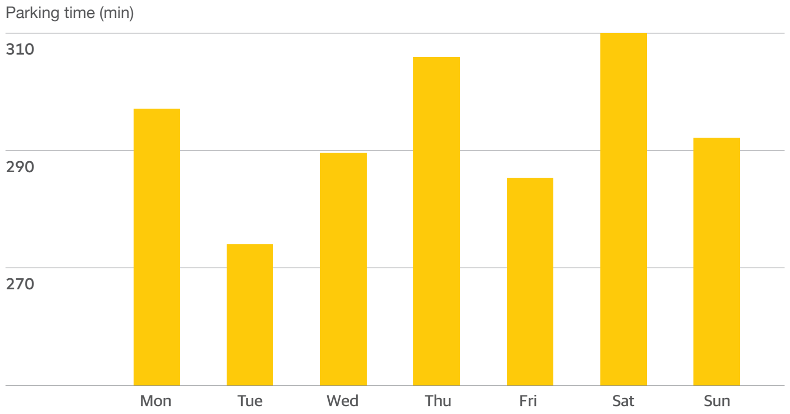


• Comparison chart of Everland traffic flow – before and after the implementation of Kakao T Parking |
Data period: July 3~31, 2019 for “before” data
July 1~29, 2020, weekdays and holidays (6am~6pm) for “after” data

Parking patterns in Everland

Based on the data collected by Kakao T Parking, let’s have a look at the parking patterns of Everland visitors. Average parking time was 4 hours and 54 minutes, indicating that visitors stay in Everland for about 5 hours. Compared to 3 hours spent in shopping centers in Yongsan, Seoul, visitors tend to stay longer in theme parks than in the shopping centers. Meanwhile, we also noticed that the parking time was longer in parking lots located in business areas. For example, parking time in Pangyo public parking lot - which commuters visit often - was around 9 hours and 51 minutes during weekdays. This is twice that of Everland.

Average parking time in Everland by days of the week



• Average parking time in Everland | Data period: July 1~14, 2020

When is the parking lot most crowded?

For the analysis, Everland visitors were grouped by their parking hours and their numbers were calculated. On weekdays, most of the visitors parked for 0~3 hours, while on weekends they parked for 3~8 hours. However, the number of visitors who parked more than 8 hours were similar on weekdays and weekends. Also, the overall data showed that visitors who parked for 4~6 hours accounted for 20% of total visitors, and those who park more than 8 hours accounted for 19%. From this it can be inferred that while many users stay in the park throughout the day, more users tend to stay for only half of the day.

Everland user ratio by parking hours

	Weekdays	Weekends
Less than 1hr	23.6%	20.3%
1hr ~ less than 2hr	4.7%	2.9%
2hr ~ less than 3hr	5.8%	5.1%
3hr ~ less than 4hr	8.3%	9.1%
4hr ~ less than 5hr	10.8%	11.4%
5hr ~ less than 6hr	10.7%	12.3%
6hr ~ less than 7hr	8.7%	10.9%
7hr ~ less than 8hr	6.7%	8.2%
8hr or more	19.9%	19.3%

Peak traffic hour at the entrance is 10am, which is the opening time. Peak hour is the same for weekdays and weekends. However, the number of traffic on weekends at 10am is twice that of weekdays. Next peak hour is 5pm, which is the starting time of Night pass.

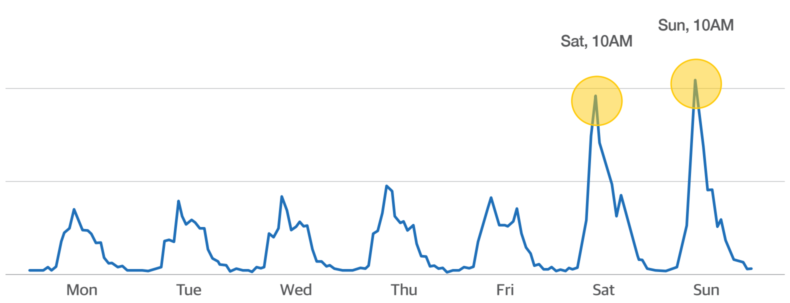
Peak traffic hour at the exit is 9pm. Considering that Everland's legendary night parade starts at 8pm, we can easily figure out that people are going home after the parade ends. An interesting fact is that the exit is crowded at 4pm on weekends, because people go home earlier compared to weekdays.

Automatic payment is processed within 1 hour from exit. This indicates that users generally start the payment process at the time of exit, as they are used to paying parking fees at the automatic or manual paying machines. However, with the help of Kakao T Parking users can check and pay their parking fees real-time on mobile. We hope to improve the users' parking experience by providing more freedom in real-time fee checking and exit process.

Enter & exit trend in Everland by days of the week

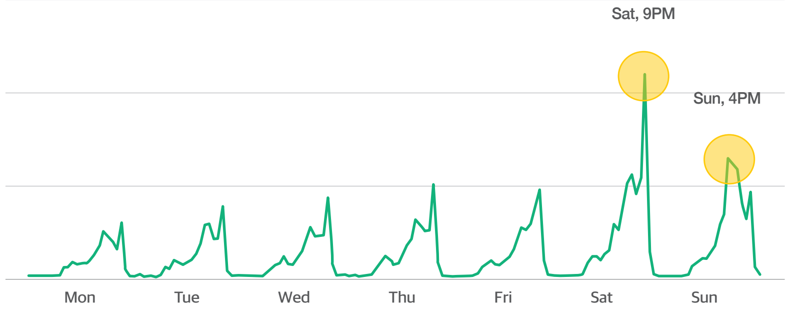
● Enter

Entrance peak time

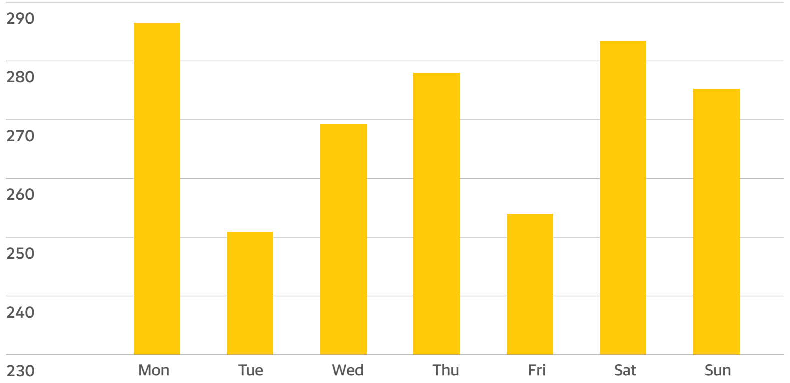


● Exit

Exit peak time



Automatic pay process initiated after entrance (min)



• Enter & exit trend in Everland by days of the week, automatic pay process initiated after entrance | Data period: July 1~14, 2020

Mobility platform for business people, Kakao T Business

When business people go outside for work or work late, generally they catch taxis. Taxis are convenient, but the process of collecting receipts and checking them one by one is somewhat bothersome. This is why Kakao Mobility came up with Kakao T Business to solve this issue. It has been two years since the service has been introduced, and a total of 6,000 companies - including 100 public institutions and enterprises - are creating a new culture of business traveling with Kakao T Business.

No hassle in business traveling

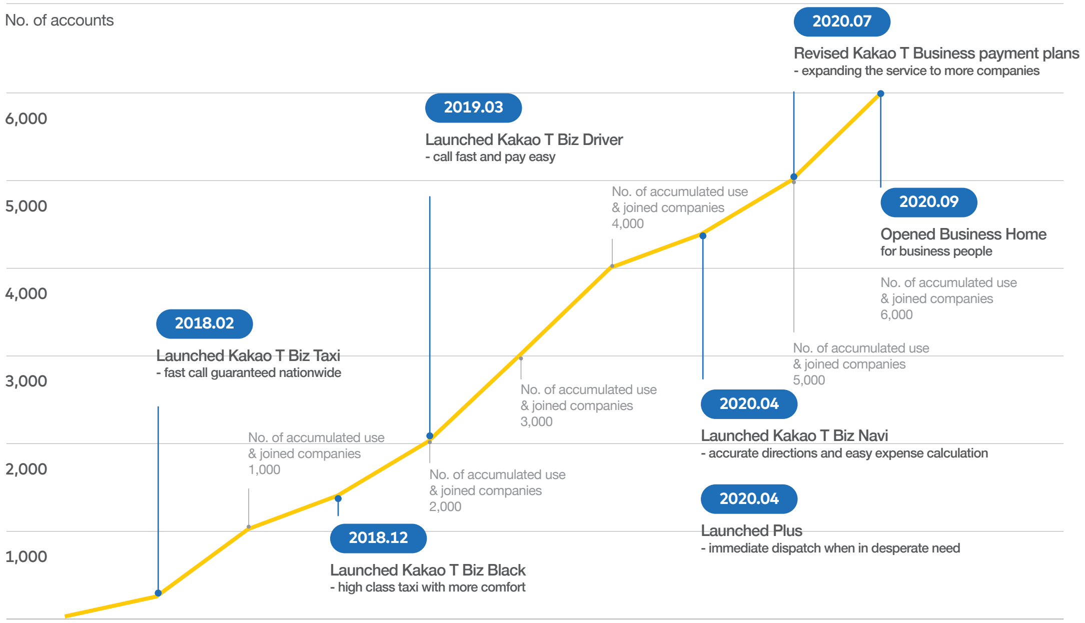
You can access Kakao T Business directly on the Kakao T app, so you don't have to download any additional apps. Anyone can use Kakao T Business by selecting the service they want in the Business tab. Fare is paid automatically so you don't even need your wallet. Receipts are sent automatically too, so you don't have to check if you got the receipt.

For business trip managers, Kakao T Business provides a convenient managing system. On this system, managers can add their employees in bulk and even group them according to their department, job group, purpose of the trip, etc. On top of that, whenever employees take Kakao T Business for business trips, managers can get reports on their departure & arrival times, call time, driver info, purpose of the trip, etc. freeing them from the hassle of checking receipts one by one.

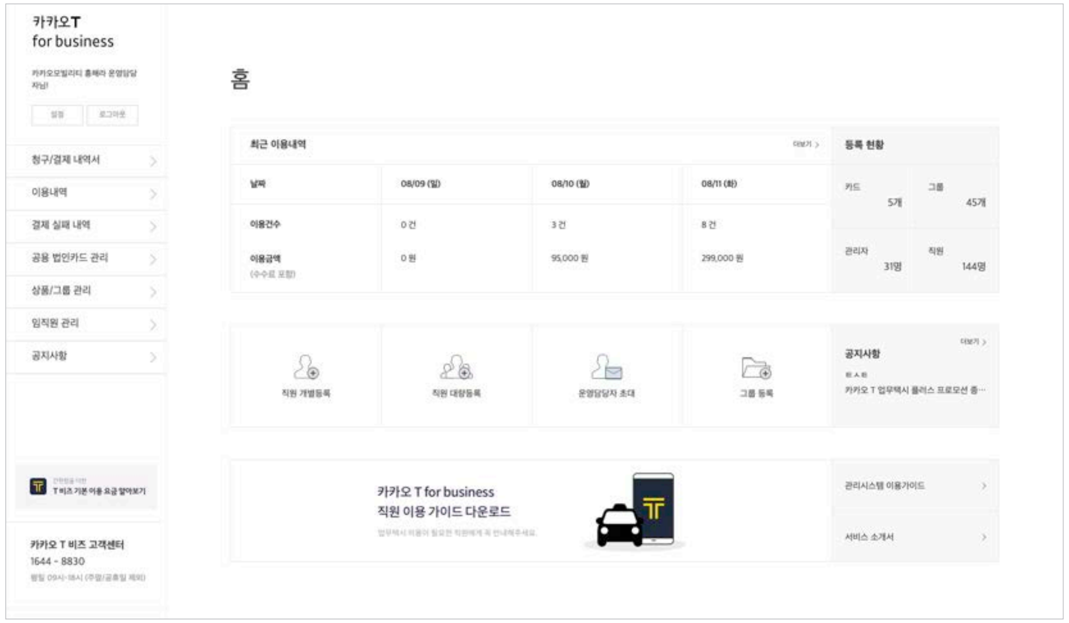
Easy and transparent management improved productivity at work

Kakao T Business allows you to set the criteria for calling a taxi based on the company policy. These criteria include days of the week & time of the day and departure & destination points for each group. This will prevent the employees' fraudulent use of taxis. Also, companies can get tax benefits since companies using Kakao T Business can get deductions on traffic congestion charge (tax levied against the owners of buildings that cause traffic congestion).
Starting from the second half of 2020, Kakao T Business launched an easy registration service for business travelers. Just go to Business Home at the bottom of the Kakao T app and enter your business email to receive your travel expense details and receipts each month and use them as evidential documents.

The path of Kakao T Business



Kakao T Business Manager Page example



최근 이용내역

날짜	08/09 (일)	08/10 (월)	08/11 (화)
이용건수	0 건	3 건	8 건
이용금액 (수수료 포함)	0 원	95,000 원	299,000 원

등록 현황

카드	5개	그룹	45개
관리자	31명	직원	144명

공지사항

카카오 T 업무택시 플러스 프로모션 종…

카카오 T for business
직원 이용 가이드 다운로드

카카오 T 비즈 고객센터
1644 - 8830

All types of business trips in one place

Kakao T Business is being improved each year to be your perfect partner of business travel. Let's look at the various services Kakao T Business brings, no wallets or receipts required, from the beginning to the end of business traveling. Here are some new services added this year.

Business Home, your travel partner

Kakao T Business Home provides customized screen settings and exclusive services for business. You can access this page by tapping on the Business tab at the bottom of the Kakao T app. If your company has joined the service, you will see the company name, logo, and a customized message. If your company did not join the service, you can still use Kakao T Business by registering your email to receive travel expense details and receipts each month.

Biz Taxi for meetings, Plus when you're late

Kakao T Biz Taxi is a nationwide, immediate call taxi service for business only. Having the highest number of drivers (230,000 nationwide), Kakao T Taxi is a faithful friend with a high matching rate. We also launched Plus in April 2020 which is a call taxi service exclusively for T Business users. Plus dispatches taxis and calculates the most reasonable fare based on AI decisions. Plus service takes action when the expected matching rate is low to guarantee taxi matching. It shows an 18% higher matching rate compared to regular calls.

Biz Driver when you need one for business

Kakao T Biz Driver is a designated driver service for business users. It is quick and easy to pay. You don't have to call an agent to get a driver and prepare cash to pay for the service. Rather, just ask for a driver on the app and use the automatic payment system that doesn't require any credit card to help your executives and business partners enjoy their ride. Also, you can call for more than one driver at once. Travel details will be sent to the management system automatically so you don't have to take care of receipts or evidential documents. In the second half of 2020, Kakao Mobility plans to open a more luxurious driver service for a high-quality ride.

Biz Navi for navigation and expense calculation

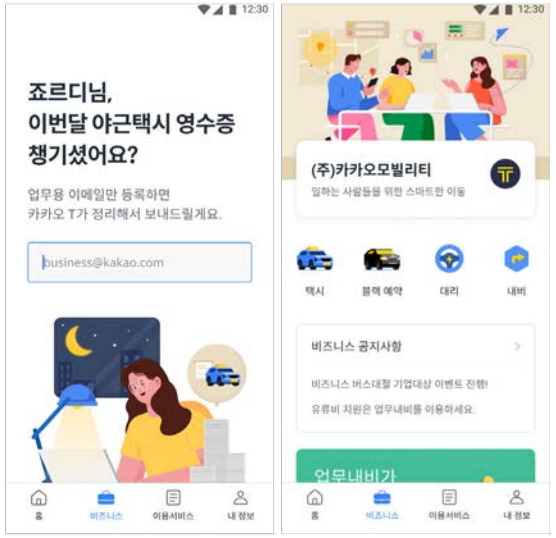
Kakao T Biz Navi is a one stop service for your navigation needs and travel expense calculation. When you activate Biz Navi on your business trip, your trip details and expected expenses including fuel costs and tolls will be calculated and sent to the management system. You also can get this info sent to your email. In the management system, you can manually set your fuel costs and mileage or use the automatic calculation by referring to the Korea National Oil Corporation's data on average prices and average mileage for Level 1 Regular type vehicles. Did you waste your time on calculating the distance and fuel cost? Did you have a hard time trying to keep your toll receipts? Meet Kakao T Biz Navi, your assistant to free you from expense calculation.

Chauffeur service for important guests with Biz Black

Kakao T Biz Black is a premium high class taxi service for business. You can reserve Kakao T Biz Black on the reservation site to receive a high-quality service consisting of premium vehicles of 2,800cc or higher and chauffeurs who will take charge in escorting your business partners for business trips, pickups at the airport and golf clubs. Services are provided for one-trip, round-trip, or designated times to suit your business needs anywhere in Seoul, Gyeonggi, Incheon, Busan and Gyeongnam. You can also reserve 250 vehicles at once for large-scaled business events or group escorts. Recently one luxury brand reserved Kakao T Black for its new product launching event and Kakao T Black received positive feedback.

Starting from Biz Taxi to Biz Driver, Biz Navi, and Biz Black, Kakao T Business is striving to become the standard of MaaS (Mobility as a Service) in the business travel industry. Maas refers to an integrated platform that connects users to all types of transportation (such as taxi and driver) to provide navigation, reservation and payment service altogether in one app. Kakao T Business will continue to link all the necessary transportations starting from premium driver service to add parking, shuttles, and rental cars in the second half of 2020.

Screenshot of Kakao T Business Home



죠르디님,
이번달 야근택시 영수증 챙기셨어요?

업무용 이메일만 등록하면
카카오 T가 정리해서 보내드릴게요.

business@kakao.com

(주)카카오모빌리티
일하는 사람들을 위한 스마트한 이동

비즈니스 공지사항
비즈니스 버스대절 기업대상 이벤트 진행!
유류비 지원은 업무내비를 이용하세요.

Kakao T Business creating a smart culture of business traveling

6,000 signed up companies, 2.6 million business trips. These are the records of Kakao T Business, marking its second anniversary. How did Kakao T Business change the culture of business traveling since its launch in 2018? Let's hear what our users think.

Q. Welcome, Kakao T Business users! Today we would like to hear about your experience with Kakao T Business - how you learned about the service, which part you like the most, and so on.

A1. Yoon, General Affairs Department, A Company

Hi, my name is Yoon and I work in the General Affairs team in A company. We adopted Kakao T Business because our employees have strongly recommended this service. We know how bothersome it can be to prepare all of your receipts, categorize them, and paste them on a paper at the end of each month when you're extremely busy. Just so you know, it's not easy for us to check them one by one either. (laughs)

On top of that, there are cases where you lose your receipts, forget why you took a taxi, and take a taxi during an unpermitted time. In any case, we have to get the evidential documents ready and that process was not easy. The GA team is especially busy at the beginning and the end of each month, you know. (laughs)

But by using Kakao T Business, we can set permitted times for calling taxis and receive details on the purpose of the trip and departure & arrival times. This has made our life, and all our employees' life so much easier that we are even getting compliments on adopting the service. (laughs) Oh, I almost forgot to mention the traffic congestion charge...you can get reductions for this charge when using Kakao T Business, which is a plus for the company too.

A2. Kim, Consultant, D Company

I had the exact experience! I also had to dig into my desk and get all my receipts pasted on a paper at the end of each month. Everytime you take a taxi you have to ask for a receipt, but sometimes you forget to do so or even worse, lose the receipt. In that case, it's out of your hands. (laughs) But now, you can call a taxi on your app and even get the trip details and receipt automatically! How convenient is that!

I especially want to mention the Plus feature. There were times when you could not catch a taxi when you had an extremely important meeting that you cannot afford to be late! But the sad thing is, my office is at a place where taxis are scarce. But with the Plus feature, I can get my taxi so fast and it's the best! As a consultant I often work until late at night, and it is very comforting to think that I can get a taxi whenever I call them.

A3. Jeong, Sales Department, H Company

As a salesman I travel frequently and I love Kakao T Biz Navi. From near the office to far away cities, I often travel with my car. But whenever I come back to the office, I had to look up the map on the internet and calculate the distance and fuel cost...what a burden! Sometimes the online map would show a route that I didn't even take. I also take highways often, but I would lose my toll receipt while paying attention on the road. However, with Kakao T Biz Navi, everything is taken care of once you start the Navi on. It calculates fuel costs and tolls for you, so you don't have to do anything when you come back to the office. One of my colleagues in the GA team told me that you can even get an automatic fuel calculation based on the average oil price.

A4. Park, Sales Department, K Company

I often use Kakao T Driver when I wine and dine with my customers. Sometimes I call drivers for myself, but most of the time I call them for my customers. Before using Kakao T Driver, I had to make a call and tell the agent the departure and destination point and wait endlessly for the driver to come. And then I had to pay for the ride and get the receipt so I could submit that to the GA team. When I'm dining with several customers...you have to repeat this all over again! However, with Kakao T Driver you can call multiple drivers at once. And with the automatic payment system you don't have to prepare cash or wait to get the receipt. Also, Kakao T drivers are very friendly compared to other drivers. In the past customers would complain to me about unfriendly drivers but after using Kakao T Biz Driver I got no complaints. I also call Kakao T drivers when I go home, too. I have high hopes on the Premium Driver service that will be launching this year.

A5. Lee, Secretary, P Company

I guess most of you use Kakao T Business for your own business trips, but I use it for others' since I work as a secretary. Whenever customers visit us or our executives have meetings outside, I reserve Kakao T Biz Black for their transportation. Chauffeurs dressed in formal attire arrive at the venue ahead of time with high-class vehicles. Everyone is satisfied with the service and it has made my job easier, too. My company's headquarters is located overseas, so HQ executives or international visitors often come to Korea but they don't speak Korean. We've heard that they had a hard time catching a taxi so we started using Kakao T Biz Black's airport service. It was a big hit! Chauffeurs wait at the airport gate to pick up our visitors and bring them to our office. Our visitors were greatly satisfied with the service, and I don't know how I would live without Kakao T Biz Black! (laughs)

A6. Park, Business Development Team, N Company

Well there is nothing left for me to say! (laughs) I have been using Kakao T Business since its launch, but the best part for me is that more transportations are added one by one in the service so I can use them all in just one app. In the old days, driver and taxi service were separated, and you could use only one map provided by the company to calculate fuel costs. The company was trying to help you actually, but it was quite complicated since the services were not integrated and had different processes. If the company decides to change the service provider then you had to get familiar with a new process, which was a burden. But I have been using Kakao T Business all along so there is nothing to be complicated and I love the fact that I don't have to categorize my receipts by each service provider. (laughs)

Need a bus?
Get Kakao T Shuttle

Kakao T Shuttle is Kakao Mobility’s bus rental service that provides shuttle buses for anyone so that they can go to their destination easily. It successfully started its beta service at Ultra Music Festival Korea in June 2019 and launched its official service in August 2020.

Want to rent a bus? Kakao T is here for you

Ever had a bad experience when renting a bus? Did you have to ask for quotes from each bus charter site and check if everyone had paid their fare? After all that, did you get an old bus with a grumpy driver? Kakao T Shuttle wants to change this somewhat bothersome and uncomfortable experience into an enjoyable one, by providing reasonable prices, easy reservations, clean vehicles and friendly drivers.

Kakao T Shuttle runs 24/7. Users can always reserve a bus on the Kakao T app and a reservation site. You don’t have to ask for quotes, just enter the destination and the date and you’ll be provided with a price. Pay with the credit card stored in your Kakao T app so you don’t have to wire money or call the bus office to pay with your credit card on the phone.

To ensure a fun and comfortable trip, Kakao T Shuttle makes sure to check whether the vehicle has undergone proper disinfection process, the vehicle is fairly new, insurance is fully covered, the vehicle is legal and directly operated, the driver has finished all necessary training, and the price is reasonable. Kakao T Shuttle knows users' concerns, and strives to provide the most satisfactory shuttle experience at a reasonable price for every user.

Open Shuttle a personally arranged shuttle

In the KakaoTalk app, there is a feature called “Open Chat” which is a chatting service you can create with a topic you choose. You can also invite other users by sharing a link. But what if you can arrange a shuttle, with a theme of your choice, and share a link with other users to invite them just like Open Chat?

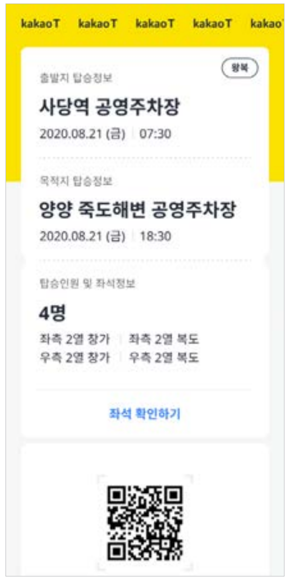
Invite to Join the Shuttle

With the “Invite to Join the Shuttle” feature in Open Shuttle, you can book a shuttle based on the destination and date of your choice and share the link with other users. By clicking on the link, people can access Kakao T Shuttle to pay their fare or select their seats. No more chartering a bus and sending notice to each and every member to collect money from them.
Are you having a hard time deciding where to go and could not arrange a shuttle? Just search for others’ shuttle buses and try making a reservation. Do you want to go to your favorite singer’s concert with other fans but have no idea how to rent a bus? Are you tired of checking if your surfing or hiking members have paid their fare and selecting seats for them? “Invite to Join the Shuttle” will be your ultimate solution.

Charter a Shuttle

If you need a bus for your wedding guests, or you are going on a workshop with your teammates, why not try using the “Charter a Shuttle” feature in Open Shuttle? You don’t have to call each bus company to get their quote - simply check your prices and pay right away on Kakao T Shuttle.

Example of Kakao T Shuttle bus ticket

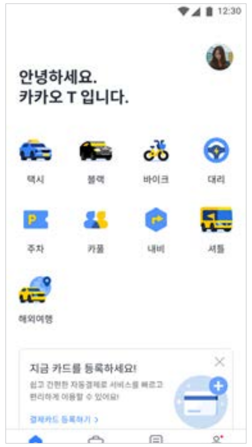


출발지 탑승정보
사당역 공영주차장
2020.08.21 (금) | 07:30

목적지 탑승정보
양양 죽도해변 공영주차장
2020.08.21 (금) | 18:30

탑승인원 및 좌석정보
4명
좌측 2열 창가 | 좌측 2열 복도
우측 2열 창가 | 우측 2열 복도

❶ Click the Shuttle icon

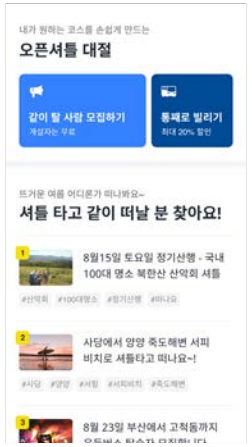


12:30

안녕하세요.
카카오 T 입니다.

지금 카드를 등록하세요!
쉽고 간편한 자동결제로 서비스를 빠르고 편리하게 이용할 수 있어요!
결제카드 등록하기 >

❷ Select the service



내가 원하는 코스를 손쉽게 만드는
오픈셔틀 대절

같이 탈 사람 모집하기
개설자는 무료

통째로 빌리기
최대 20% 할인

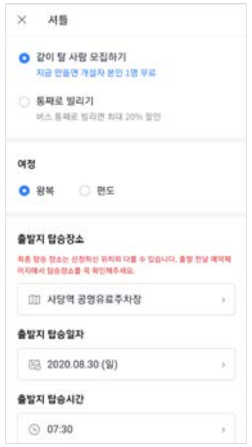
뜨거운 여름 어디론가 떠나봐요~
셔틀 타고 같이 떠날 분 찾아요!

1 8월15일 토요일 정기산행 - 국내 100대 명소 북한산 산악회 셔틀
#산악회 #100대명소 #정기산행 #떠나요

2 사당에서 양양 죽도해변 서피 비치로 셔틀타고 떠나요~!
#사당 #양양 #서핑 #서피비치 #죽도해변

3 8월 23일 부산에서 고척돔까지

❸ Enter departure info



셔틀

● 같이 탈 사람 모집하기
지금 만들면 개설자 본인 1명 무료

○ 통째로 빌리기
버스 통째로 빌리면 최대 20% 할인

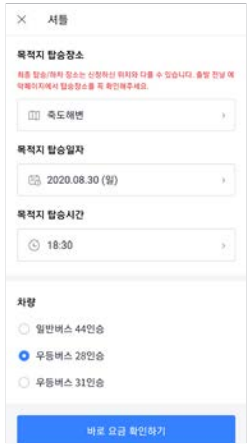
여정
● 왕복 ○ 편도

출발지 탑승장소
최종 탑승 장소는 신청하신 위치와 다를 수 있습니다. 출발 전날 예약페이지에서 탑승장소를 꼭 확인해주세요.
사당역 공영유료주차장

출발지 탑승일자
2020.08.30 (일)

출발지 탑승시간
07:30

❹ Enter destination info



셔틀

목적지 탑승장소
최종 탑승/하차 장소는 신청하신 위치와 다를 수 있습니다. 출발 전날 예약페이지에서 탑승장소를 꼭 확인해주세요.
죽도해변

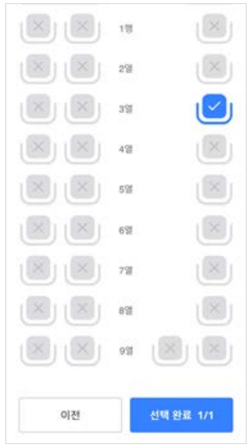
목적지 탑승일자
2020.08.30 (일)

목적지 탑승시간
18:30

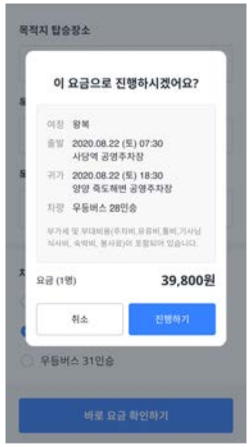
차량
○ 일반버스 44인승
● 우등버스 28인승
○ 우등버스 31인승

바로 요금 확인하기

❺ Select seats



❻ Check the price



목적지 탑승장소

이 요금으로 진행하시겠어요?

여정 왕복
출발 2020.08.22 (토) 07:30
사당역 공영주차장
귀가 2020.08.22 (토) 18:30
양양 죽도해변 공영주차장
차량 우등버스 28인승

부가세 및 부대비용(주차비, 유류비, 톨비, 기사님 식사비, 숙박비, 봉사료)이 포함되어 있습니다.

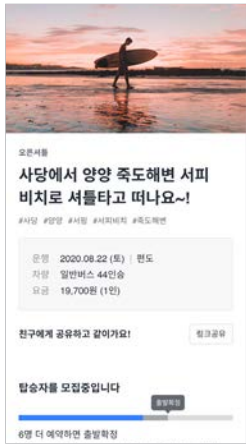
요금 (1명) 39,800원

취소 진행하기

○ 우등버스 31인승

바로 요금 확인하기

❼ Create a shuttle



오픈셔틀

사당에서 양양 죽도해변 서피 비치로 셔틀타고 떠나요~!

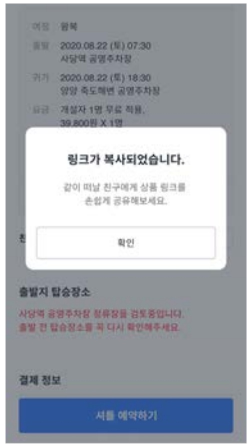
#사당 #양양 #서핑 #서피비치 #죽도해변

운행 2020.08.22 (토) | 편도
차량 일반버스 44인승
요금 19,700원 (1인)

친구에게 공유하고 같이가요! 링크공유

탑승자를 모집중입니다
출발확정
6명 더 예약하면 출발확정

❽ Share the shuttle



여정 왕복
출발 2020.08.22 (토) 07:30
사당역 공영주차장
귀가 2020.08.22 (토) 18:30
양양 죽도해변 공영주차장
요금 개설자 1명 무료 적용.
39,800원 X 1명

링크가 복사되었습니다.
같이 떠날 친구에게 상품 링크를 손쉽게 공유해보세요.
확인

출발지 탑승장소
사당역 공영주차장 정류장을 검토중입니다.
출발 전 탑승장소를 꼭 다시 확인해주세요.

결제 정보

셔틀 예약하기

How to use Open Shuttle - a personally arranged shuttle

Feel like traveling? Kakao T Shuttle is here for you

Do you feel like going somewhere this weekend, but have no clue where to go? Kakao T Shuttle might have the answer. With the "Invite to Join the Shuttle" feature, you can see what shuttles have been created by other users and even make a reservation. All the places you've been wanting to go, including surfing sites in Yangyang, strawberry farms, various concerts and festivals, are now your new destination. Kakao T Shuttle is also planning to open a new service called the "T Shuttle", which is a shuttle curation service that takes you to various places in Korea.

Q. How did you become aware of Kakao T Shuttle?
A. I noticed this new bus icon when I was calling a taxi on the Kakao T app as usual. I tapped the icon out of curiosity and found a shuttle for the New Year sunrise festival, so I immediately booked the shuttle. You see, when I was living with my family we used to go to this festival a lot but now that I live alone it wasn't easy to go there because I can't drive and there is no public transportation service to get there.

Q. What did you like most about the Kakao T Shuttle?
A. I had high hopes as the service was provided by Kakao T. I also had concerns too, since I had bad experiences in the past when I had to take a chartered bus that was so old and unclean. On top of that, the bus driver was very impolite. However, Kakao T Shuttle was a big hit. It was very clean and comfortable, and the driver was very nice. I loved the decoration topper they gave us - I could take some really nice pictures with it! Also the simple boarding process using the app and message, and being able to take the bus near my house were big pluses.

Q. Do you have any requests to Kakao T Shuttle?
A. I heard that Kakao T Shuttle is planning to open a new bus chartering service in August, which is great because I a m getting married this November and was wondering how I should bring my guests living in non-Metropolitan areas. I searched lots of bus chartering services but they all provided different prices and no info on the drivers. Thanks to the Kakao T Shuttle, I am now relieved, since it is very reliable! One more thing, I love sports activities so I go hiking, surfing and diving, and snowboarding whenever I can. But the thing is, it is almost impossible to go to the mountains by public transportation since my gears and equipment are so heavy. But now I can just easily book a shuttle with my friends to get there! (laughs) Oh, and my request for you is to run this service as long as you can! (laughs)

Let's 2020
놀러갈 때도 카카오T 셔틀

Picture of New Year Sunrise in 2020

LIFE INNOVATION

/

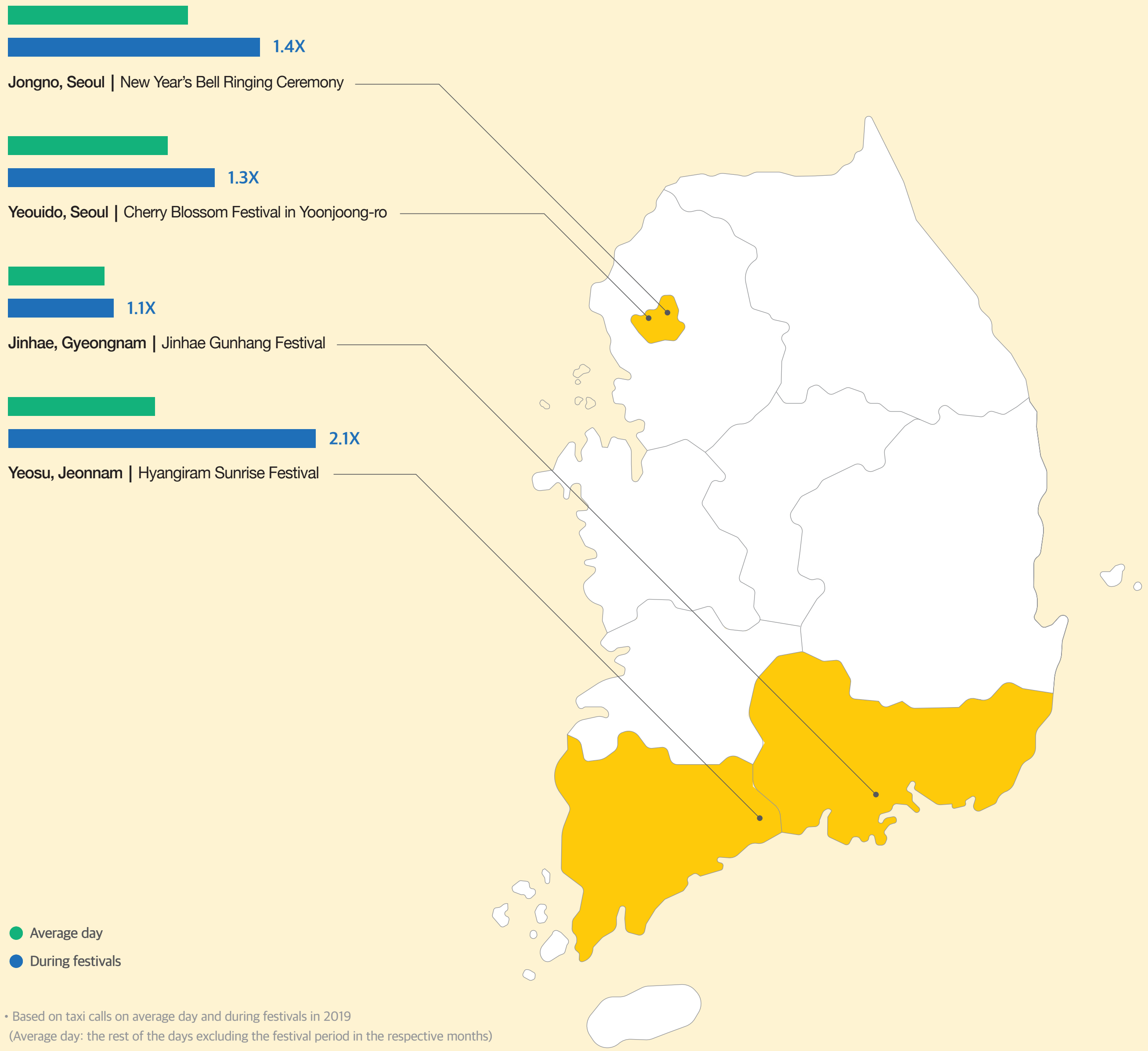
Our daily lives revealed by data

Taxi travel calendar - best places to travel by taxi in Korea

Mobility reflects many aspects of our lives. It is not just a locational change between two places, it's a trip, adventure, and a journey. Based on this thought, Kakao Mobility investigated the whens and wheres of the places that showed occasional hikes in taxi calls and made a festival calendar of Korea. Why don't we go for an exciting journey together?

Beginning of a festive year
January ~ April

Increase in daily taxi calls due to festivals



• Based on taxi calls on average day and during festivals in 2019
(Average day: the rest of the days excluding the festival period in the respective months)

New Year's Bell Ringing Ceremony

January | Jongno, Seoul

This festival is held at the New Year's Eve to celebrate the coming of the new year by ringing the Bosingak Bell 33 times at midnight. The Celebration includes top singers' performances, light shows, and many more. Thanks to this festival, around 80,000 to 100,000 people gather around Jongno despite the freezing weather.

Photo by Clipart Korea

Hyangiram Sunrise Festival

January | Yeosu, Jeonnam

Hyangiram, which is one of the best sites to see the sunrise in Korea, holds the sunrise festival every year to wish good luck and prosperity in the new year. As one of the four Avalokitesvara Bodhisattva temples in Korea, people believe that your wish can come true if you pray in Hyangiram. You can also enjoy other various events including fireworks, make-a-wish parade, and much more.

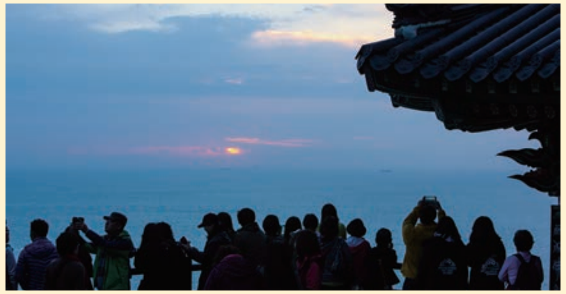


Photo by Korea Tourism Organization (Jiho Kim, KTO)

Cherry Blossom Festival in Yoonjoong-ro

April | Yeouido, Seoul

This festival takes place in Yeouido during the cherry blossom season in April. You can enjoy the beautiful spring flowers such as the flowering cherry, forsythia, bridal wreath, and azalea around the streets of the National Assembly building.

Photo by Korea Tourism Organization (Beonsu Kim, KTO)

Jinhae Gunhang Festival

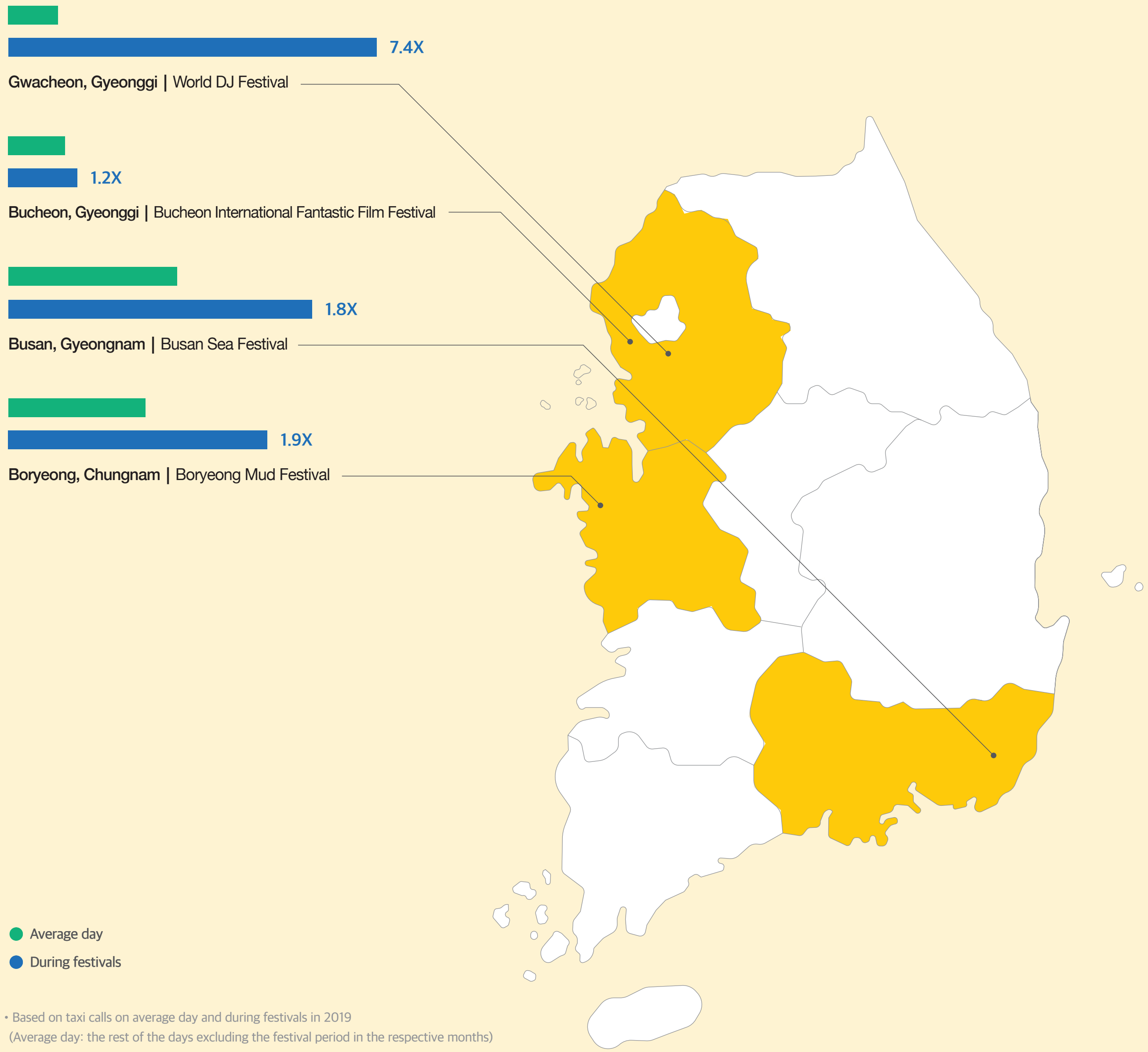
April | Jinhae, Gyeongnam

Another famous cherry blossom festival and also a memorial ceremony for a military hero, general Yi, Sun-sin. Jinhae has the highest number of cherry flowers per unit area and people can enjoy the full blossom of cherry flowers in the city. Also, the Romance Bridge in Yeojwacheon was picked as one of the 100 most beautiful streets in Korea. The military band parade is a famous tourist attraction as well.

Photo by Korea Tourism Organization (Live Studio)

Every cell of your body awakening
June ~ July

Increase in daily taxi calls due to festivals



• Based on taxi calls on average day and during festivals in 2019
(Average day: the rest of the days excluding the festival period in the respective months)

World DJ Festival

June | Gwacheon, Gyeonggi

Also called as Wordife in short, the World DJ Festival is the first EDM music festival held in Korea. It is held in May every year, and world famous DJs visit Korea to show their performances while beaming laser shows and fireworks light up the night sky. As 800,000 people have visited the festival for the last 13 years, the festival has become the legendary electric music festival in Korea.

Photo by World DJ Festival official homepage

Bucheon International Fantastic Film Festival (BiFan)

June | Bucheon, Gyeonggi

BiFan was first held in 1997 in Bucheon, Gyeonggi and has been holding the festival every year since. As the biggest film festival in Asia, people can enjoy about 200 genre films and participate in events, performances and exhibits.

Photo by World DJ Festival official homepage

Boryeong Mud Festival

July | Boryeong, Chungnam

Boryeong Mud Festival is a local festival held in Daecheon beach. You can not only enjoy sea bathing but also various events using high quality mud powder that was collected from a clean mud flat. So many entertaining events such as mud fountain, mud massage, mud bath, and mud pool slide provide special moments to visitors from domestic and abroad.

Photo by Korea Tourism Organization (Jeong Sungjoo)

Busan Sea Festival

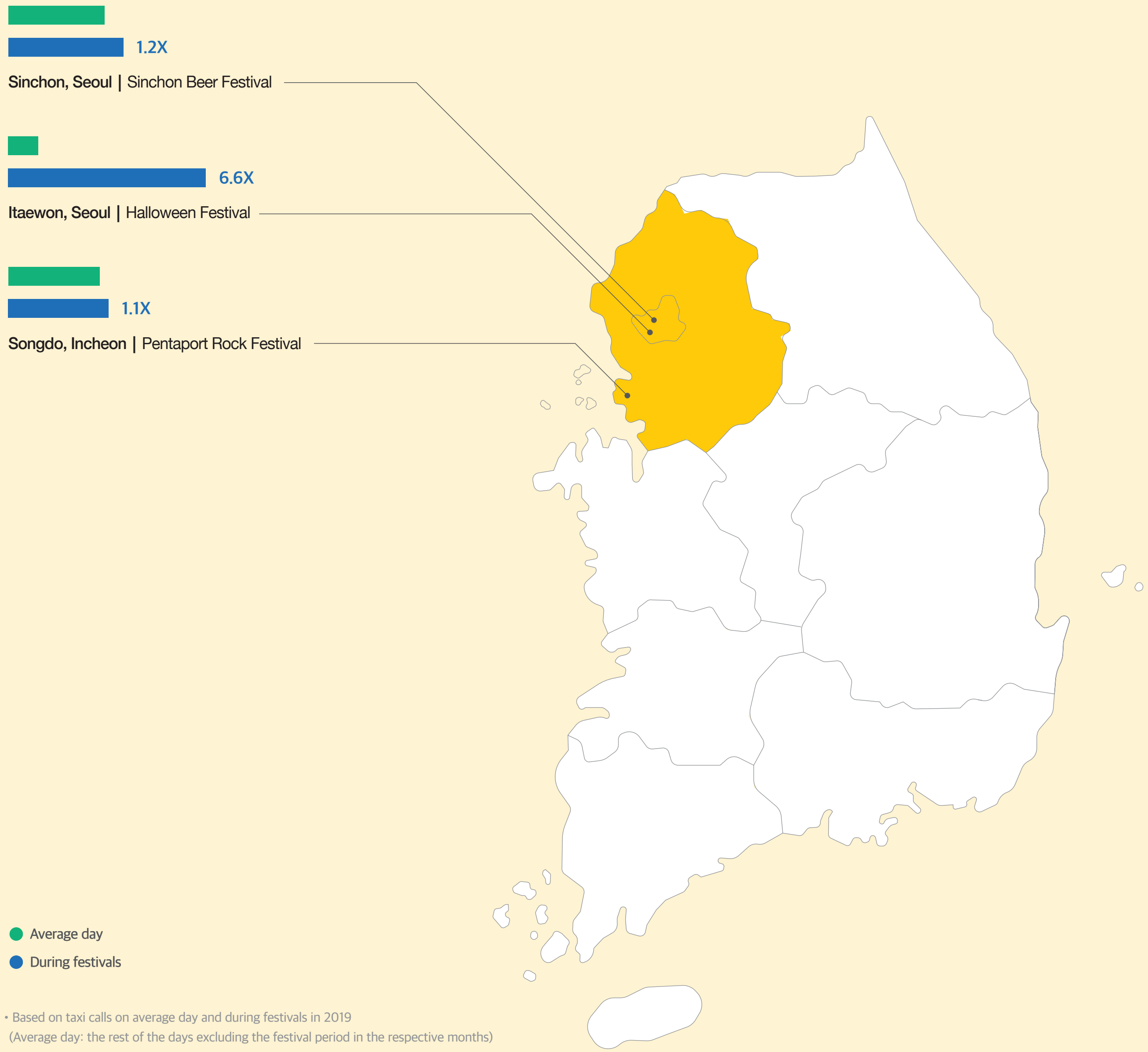
July | Busan, Gyeongnam

Busan is the most popular seaside city in Korea. Every summer, the Busan Sea Festival is held in five beaches in Busan, which are Haeundae, Gwanganri, Dadaepo, Songdo and Songjeong. You can enjoy music concerts, beach festivals, seaside art festivals and many more. Like water sports? You can windsurf and play beach volleyball, too.

Photo by Busan Culture & Tourism Festival Organization Committee official homepage

Radiate youth
August ~ October

Increase in daily taxi calls due to festivals



• Based on taxi calls on average day and during festivals in 2019
(Average day: the rest of the days excluding the festival period in the respective months)

Pentaport Rock Festival

August | Songdo, Incheon

Held in Songdo Moonlight Festival Park located in the downtown area of Songdo, popular musicians from all over the world come to join this rock festival. With the simmering sun and hot lineups, the festival is a good chance to boost your rocker spirit!

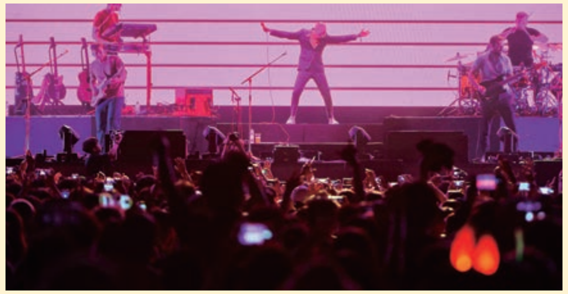


Photo by Pentaport Rock Festival official homepage

Sinchon Beer Festival

September | Sinchon, Seoul

How would you like a cool beer on a cool autumn night? Do you also want to see various trending foods and entertainments in the city? Introducing the Sinchon Beer Festival, where you can relieve your stress in a cheerful and exotic atmosphere. Held on September 20 to 22 on Yeonseiro in Sinchon, this festival is a gem for beer lovers. You can also enjoy hand-made beer, international food, EDM parties and much more.

Photo by Sinchon Beer Festival official homepage

Halloween Festival

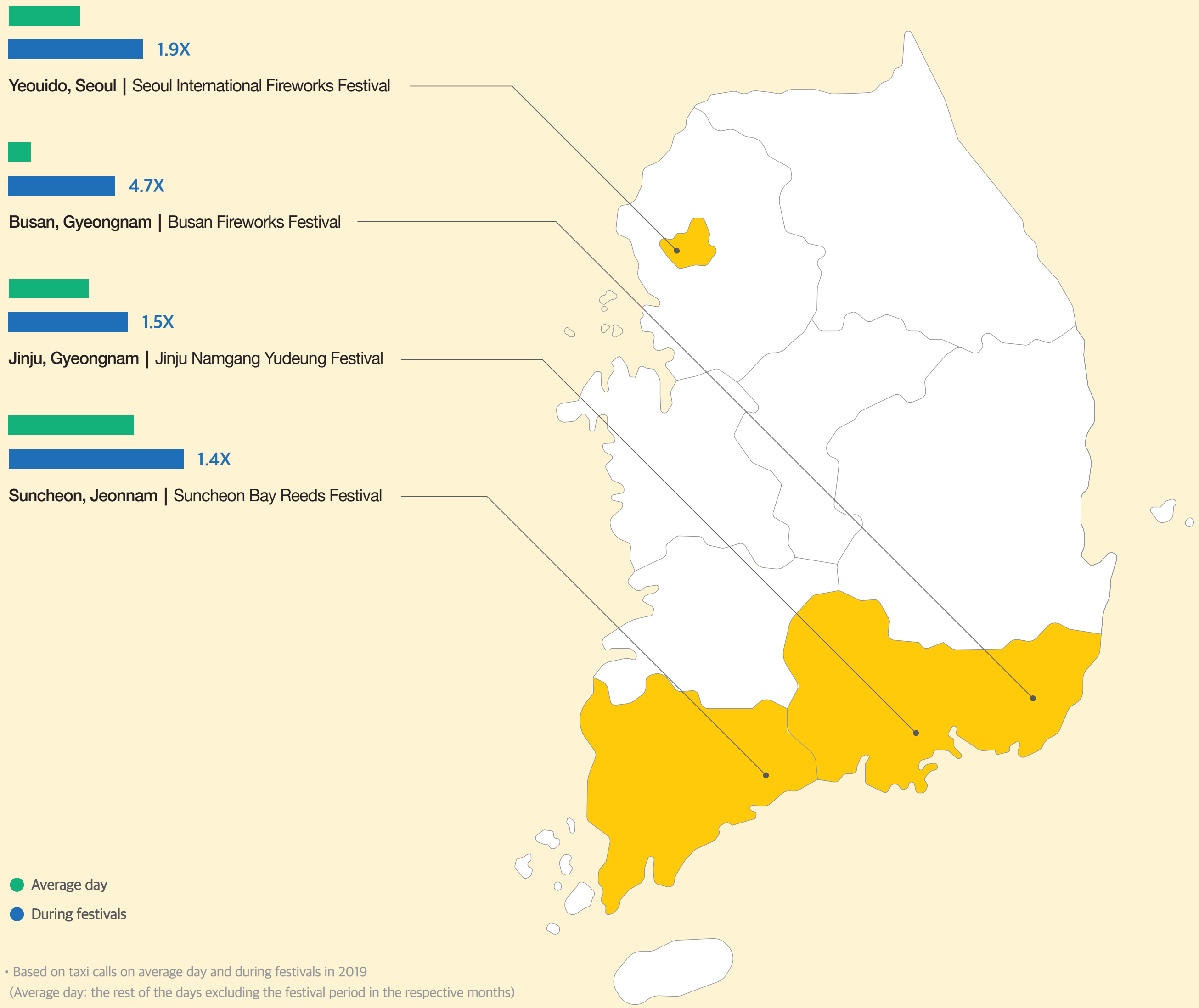
October | Itaewon, Seoul

Halloween originates from the western society, but it is now also a major festival in Korea. Held on October 31, young people wear unique costumes and gather on the Halloween day and on weekends to enjoy the festival. Itaewon is one of the most famous places to go to on Halloween, so if you want to enjoy the K-halloween party choose Itaewon!

Photo by Instagram @si_y_im

Dazzling scenery awaits
October ~ November

Increase in daily taxi calls due to festivals



• Based on taxi calls on average day and during festivals in 2019
(Average day: the rest of the days excluding the festival period in the respective months)

Seoul International Fireworks Festival

October | Yeouido, Seoul

Held around the end of September or the beginning of October, you can see more than 100,000 firecrackers lightening up the night sky in Yeouido Hangang Park. This is one of the most popular festivals in Seoul, and more than a million people come to see the beautiful fireworks decorating the night scenery.

Photo by Korea Tourism Organization (IR Studio)

Jinju Namgang Yudeung Festival

October | Jinju, Gyeongnam

Jinju Namgang Yudeung Festival originated from the concept of yudeung (floating lanterns) that were used as military signals to prevent Japanese armies from crossing the river and as communications sent to families during the Japanese Invasion in 1592. Colorful lanterns reflected on the Namgang river adds splendor to the scenery while people can add more fun by participating in various events. The festival was selected as one of the Go-global festivals for five years in a row.

Photo by Korea Tourism Organization (Kim Sungcheol)

Suncheon Bay Reeds Festival

October | Suncheon, Jeonnam

If you would love to get out of the city and enjoy some fresh air in nature, we recommend Suncheon. With golden reeds dancing in the endlessly open field, you can even watch flocks of birds fly by. With the scenery changing by each hour, Suncheon Bay is one of the must sees in Korea.

Photo by Korea Tourism Organization (IR Studio)

Busan Fireworks Festival

October | Busan, Gyeongnam

Think about marvelous fireworks decorating the night sky, and Gwanganri beach underneath it. It can't be better. Busan Fireworks Festival is now a national festival that presents themed fireworks. With the unique and colorful fireworks and special events including cultural art, street performance, and Eve performance, the festival is loved by Koreans.

Photo by Korea Tourism Organization (Korea Photographers Association, Yoon Minho)

Weekend surfing is the hippest hobby these days

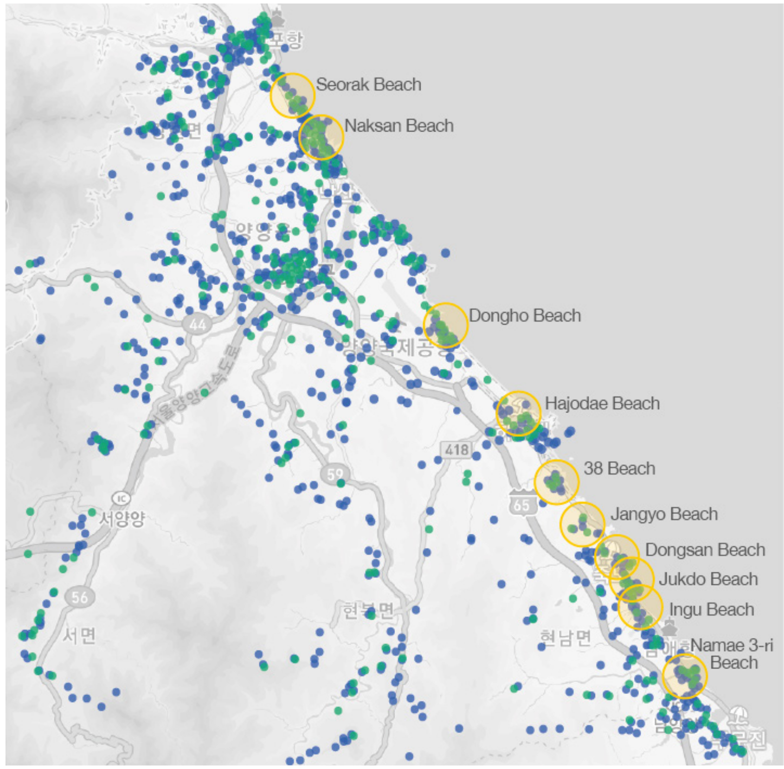
Surfing was something unusual, something you could only see on the background of a karaoke TV or in foreign movies. But now, surfing has become one of the hippest hobbies in Korea. Yangyang in Gangwon, Busan, and Jeju Island are the top 3 surfing spots.
On every popular beach where surfers flood in, it is easier to see surfers than sunbathers. Among the popular surfing spots in Korea, Yangyang is the center of surfing. Yangyang alone has so many surfing beaches including Namae, Ingu, Jukdo, Dongsan, Gisamun (38 beach), Hajodae (Surfyy Beach), Dongho, Seorak, etc. To meet the demands of increasing surfers, Gangwon province has dedicated main beaches in Yangyang as the surfing special zone.

Yangyang, the paradise of weekend surfers living in metropolitan area

“Weekend surfers” refer to those who work hard during the weekdays and go surfing on weekends. Most of the surfers living in the metropolitan area (Seoul, Gyeonggi, etc) crowd into Yangyang on weekends. Due to the surfing conditions, surfers prefer the East Sea even though the West Sea is closer. With the opening of the Seoul-Yangyang highway in June 2017, it is now easier to access Yangyang and more surfers are visiting the place year after year.

Metropolitan surfers tend to visit all the hotspots in Yangyang. You can see in the picture below the destinations of drivers from the metropolitan area who visited Yangyang on the weekends with Kakaonavi on. Excluding the downtown area and Naksansa, most of the destinations are distributed on the surfing spots. Top destinations include Jukdo beach, which is also known as the mecca of the surfers, surfing shops, guest houses, must-eat places, Yangridangil near Ingu beach where most cafes are located, and Surfyy beach. Surfyy beach, also called Hajodae beach, is now a surfing beach loved by metropolitan surfers which was once a military zone where no civilians were allowed.

Destinations in Yangyang and major surfing spots (departed from the metropolitan area)

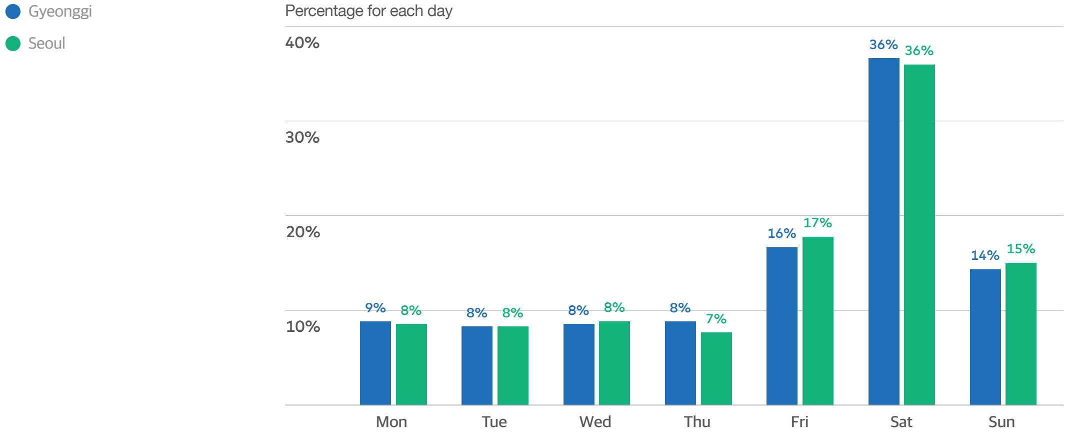


• Destinations in Yangyang and top surfing spots | From Jan. 2019 to Jun. 2020, based on Kakao Navi start-up

Surfers visit Yangyang on weekends the most Off you go on Friday night!

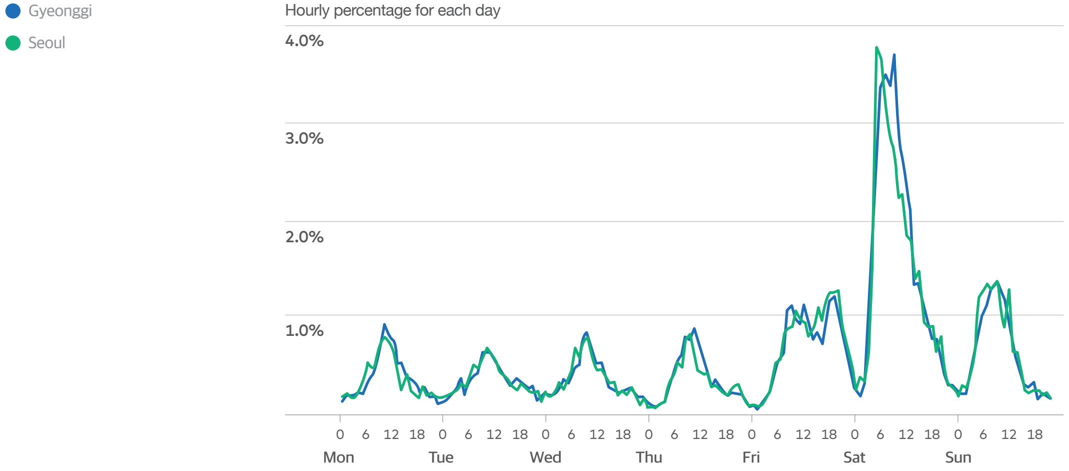
So, when do the “weekend surfers” living in the metropolitan area visit Yangyang? By calculating the data from Kakaonavi, the pattern of people going to Yangyang surfing spots from Seoul and Gyeonggi was analyzed. The highest number of visitors were seen on Saturdays, Fridays and Sundays. About 70% of surfers from Seoul and Gyeonggi headed to Yangyang between Fridays and Sundays. That is why they are called “weekend surfers”.

Ratio of metropolitan surfers visiting Yangyang by days of the week



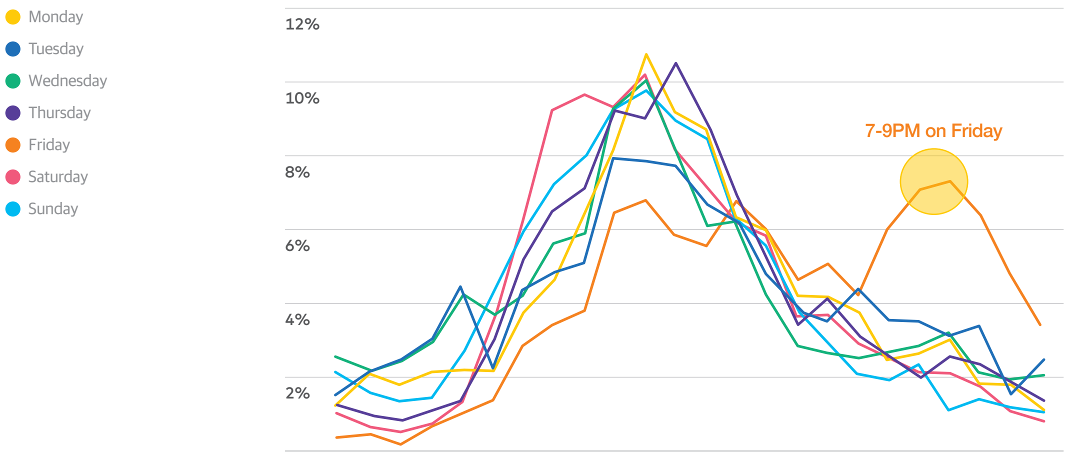
Let’s see the hourly data for each day. According to data, most metropolitan surfers head to Yangyang on Saturday mornings. Out of seven days of a week, those who headed to Yangyang on Saturday mornings (6am~12pm) accounted for 21% of surfers in Seoul and 22% of surfers in Gyeonggi.

Ratio of metropolitan surfers visiting Yangyang each day (including hourly data)



Data also showed that surfers who wanted to get a head start left for Yangyang right after work on Fridays. According to the departure hourly data, peak time was mostly in the mornings but it was 7pm to 9pm on Fridays. This shows that a considerable number of weekend surfers living in the metropolitan area want to start their weekends in Yangyang beach.

Daily-hourly visiting patterns of metropolitan surfers



SURFYY BEACH

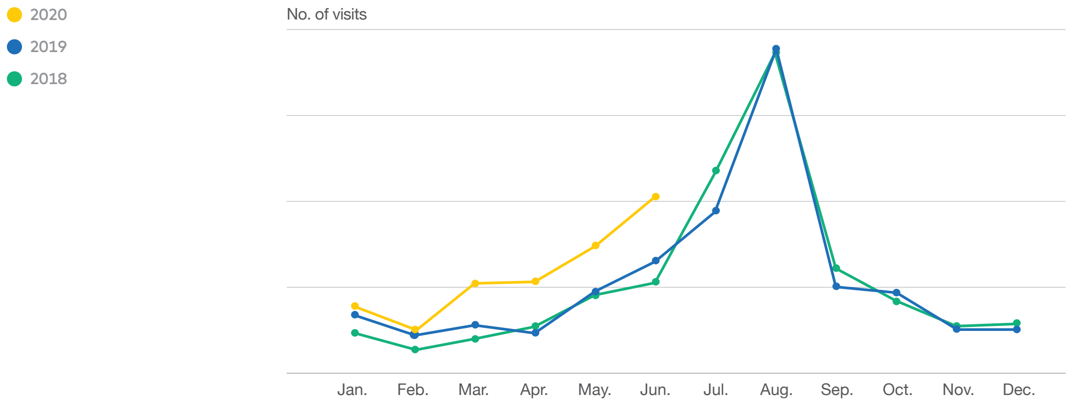
- No. of metropolitan surfers visiting Yangyang by days of the week | From Jan. 2019 to Jun. 2020, based on Kakaonavi start-up
- No. of metropolitan surfers visiting Yangyang each day (including hourly data) | From Jan. 2019 to Jun. 2020, based on Kakaonavi start-up
- Daily-hourly visiting patterns of metropolitan surfers | From Jan. 2019 to Jun. 2020, based on Kakaonavi start-up

No. of visits toYangyang increased in the 1st half of the year due to COVID-19

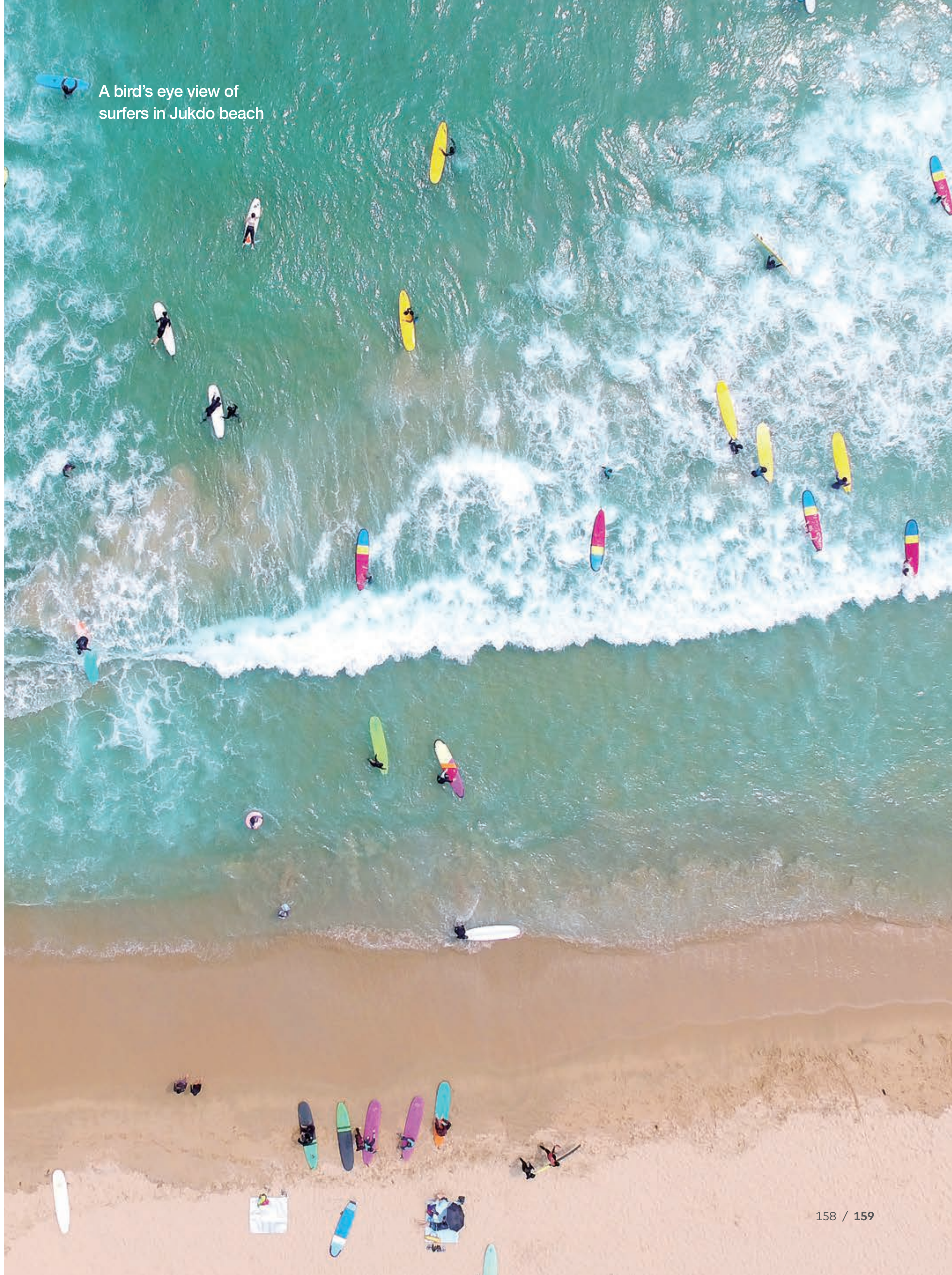
As COVID-19 has been widely spread since March this year, the number of surfers visiting Yangyang from the metropolitan area is increasing. The number of surfers in the first half of the year has increased by 60% and the number doubled in March and April compared to last year. This is a big change considering that the visiting patterns did not change much in 2018 and 2019. We assume that more and more surfers have visited Yangyang surfing spots as COVID-19 crisis continues and overseas traveling is limited.

Whenever a great tide is forecasted, more metropolitan surfers will head to Yangyang on weekends. For those who share similar hobbies and head to the same place at the same time, we introduce the Open Shuttle service provided by Kakao T Shuttle. You can easily book a shuttle by using the “Invite to Join the Shuttle” feature. Just enter the destination and date, and share the link to invite other surfers who wish to go to Yangyang, too. You can free yourself from driving, reduce the cost, and enjoy the ride while chatting with other surfers on your way to the beach.

Trend of metropolitan surfers visiting Yangyang for the last 3 years



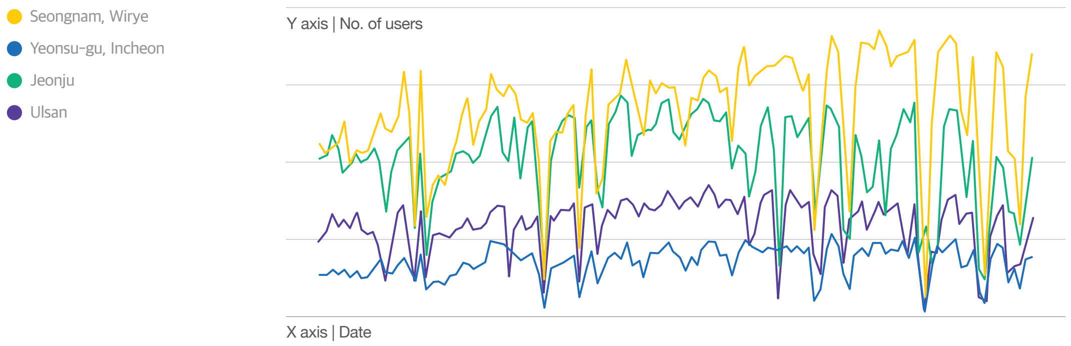
• Trend of metropolitan surfers visiting Yangyang for the last 3 years |
Jan. 2019~Jun. 2020, based on no. of Kakaonavi route guidance, indexing data for Jan. 2020 to 100



A bird’s eye view of surfers in Jukdo beach

The correlation of weather with bikes

No. of bike users per date & place



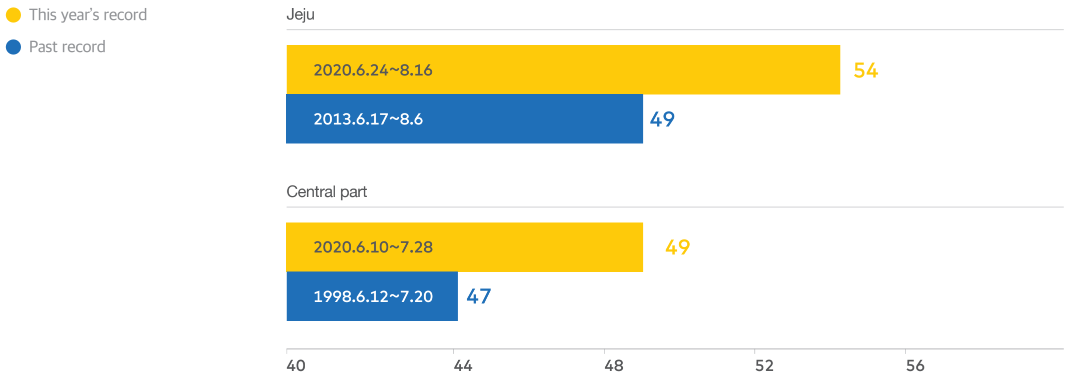
[Question] Can you tell from the graph the rainy days?
This is a graph on the Kakao T Bike usage pattern for each city. As you can easily notice, the low points in the graphs indicate rainy days. When the rain is heavy or when it rains all day, the graph becomes steeper. For electric bike users it is not easy to avoid rain and this is reflected in the usage pattern. This was fully anticipated at the preparation stage of this service.

But rain doesn't stop all bike users. As it was mentioned before, Kakao T Bike has highly loyal users. They take the bike whenever they can, regardless of the pouring rain and typhoons. This was not anticipated, though. Kakao T Bike managers keep on thinking and preparing on when to stop and resume the service in the bad weather.

Kakao T Bike still growing in the midst of a record-high rainy season

Kakao T Bike usage rate has slightly decreased due to heavy rain, but the growth still continues. The rainy season started in the third week of June and extended its power to the central part of the peninsula in the mid-August. During this season Jeju and the central part of the country has renewed their rainfall record. It was natural that the Kakao T Bike was affected by this weather. However, excluding the first week of August when we experienced the most extreme rainfall, the usage rate per bike is still showing a two digit growth rate compared to last year.

A record-high rainy season

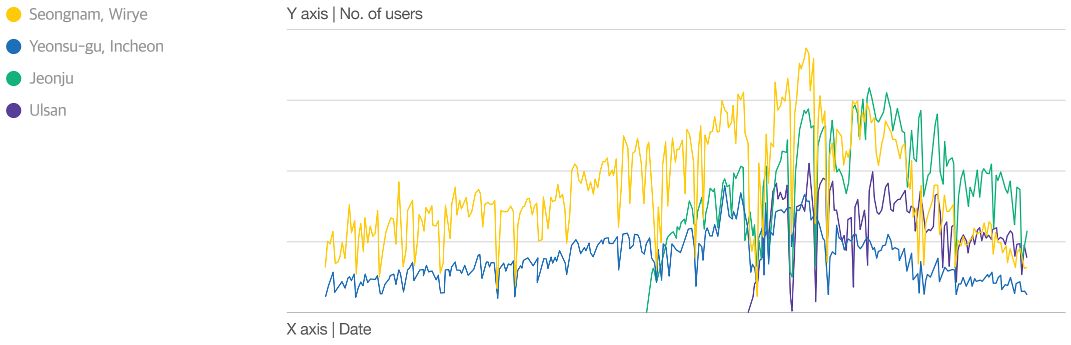


• A record-high rainy season | Source: Korea Meteorological Administration(KMA)

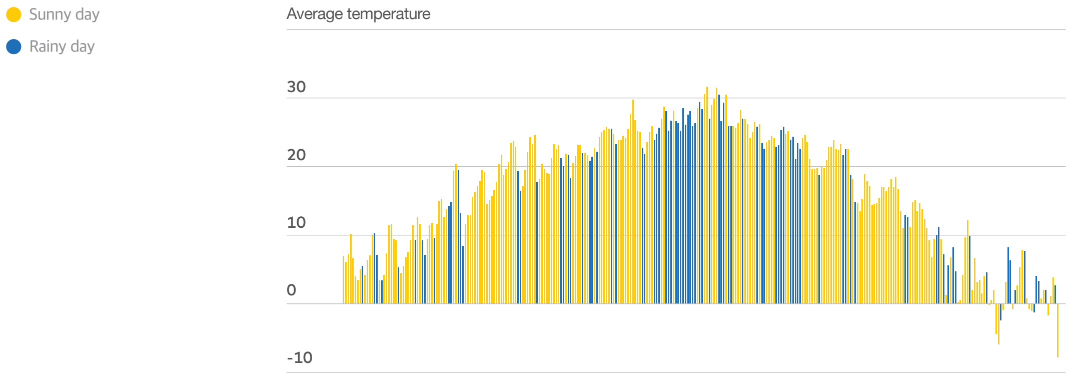
Love for Kakao T Bike overcomes the heat wave

Kakao Mobility's anticipation of Kakao T Bike's seasonal usage pattern was also proven wrong. In the preparation stage, the usage rate was expected to decrease between June and August when the weather is hot. But this was wrong. Shortly after starting the service, it was found that people enjoyed riding bikes even in hot weather. It seems people prefer riding electric bicycles that have motors to rotate the wheels for them instead of walking below the hot, simmering sun.

No. of bike users per date & place in 2019



Temperature changes and precipitation data in 2019



• No. of bike users per date & place in 2019, Temperature changes and precipitation data in 2019 |
Source: Korea Meteorological Administration(KMA)

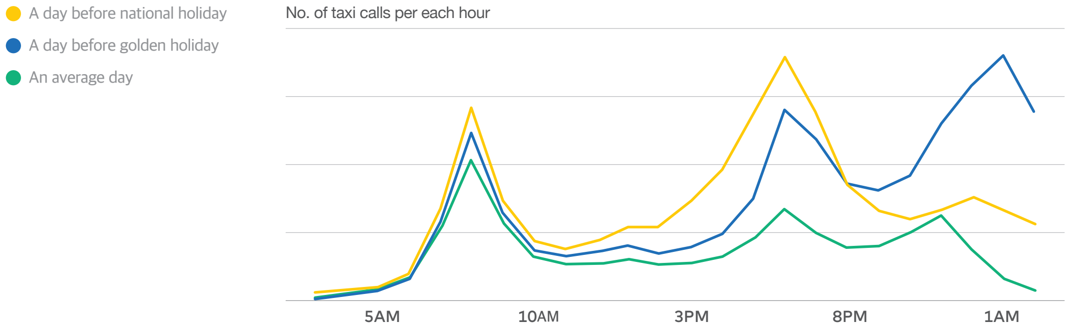
Top destinations during Golden Holidays

Changes in mobility patterns during weekdays/ national holidays/ golden holidays

How we wait for the golden holidays to come! Let's have a look at the mobility data for taxis on the night before the long holidays start. Generally the number of taxi calls increase on the day right before the holidays, but the pattern is slightly different depending on whether it's a day before the national holidays or golden holidays.

If you look at the number of Kakao T taxi calls on an average day by each hour, peak hours are 8am and 6pm (commuting time) and late night hours. However, the pattern is slightly different on the day before the first day of golden holidays. On the previous day of a national holiday, the number of taxi calls starts to increase before the office closing time and slowly calms down around 8pm, which is earlier than that of an average day. However, on the previous day of a golden holiday, the number starts to increase at 6pm, calms down for a moment, and spikes up as the night gets late. Maybe because people are meeting their friends and family they haven't seen for a long time and enjoying freedom at the late hours, throwing their stress and problems away.

Kakao T Taxi usage patterns on national holidays, golden holidays and an average day



• No. of taxi calls each day (per each hour) |
Jan. 2019 ~ Jun. 2020, average number of taxi calls each day from 3AM for 24 hours

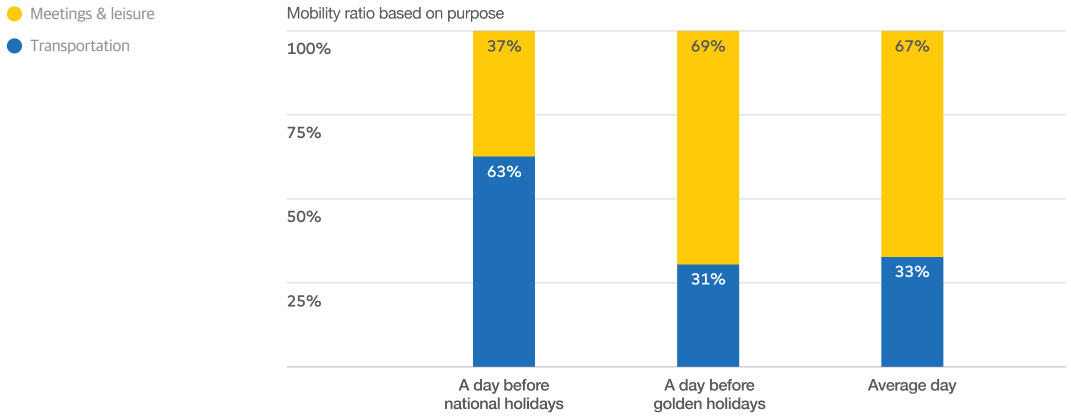
Hometown for national holidays Hot places for golden holidays

If you take a look at the top destinations in detail, you'll find the difference in the mobility pattern between an average day and the day before national or golden holidays. Everyone agrees that the busiest city in Korea is Seoul. When you look at the top 20 destinations originated from the city, you can see that on the day before the golden holidays, the number of taxi calls are up to 3 times higher than an average day. Moreover, the destinations tend to be distinctly different depending on whether it's a national holiday or not.

Data shows that the rate of taxi users heading to another transportation services on the day before the national holidays is 63%, which is twice as high as that of an average day or golden holidays (about 30%). Most of these taxi users, who are heading towards their hometown, are going to train stations or bus terminals. According to the data, 11 out of the top 20 destinations are train stations or bus terminals, and the number of taxi calls heading for these destinations is 5 times higher than that of an average day. Taxis are helping people who are trying to go to their hometown easier by taking them to other transportation services. Meanwhile, the mobility pattern on the day before golden holidays is somewhat similar to an average day. Almost 69% of users head to hot places including shopping malls, entertainment facilities, and campus streets. The number is more than twice that of an average day. They seem to head to those places to enjoy nighttime.

An interesting fact was that Itaewon and Seoul Station are all time favorites for taxi users, as they are always on the top 3 list of most visited places. By looking at the destination and call time data of taxis we take in our daily lives, we can easily imagine what might have happened.

Comparison of Kakao T Taxi's mobility patterns on national holidays, golden holidays and an average day



• Comparison of Kakao T Taxi's mobility patterns on national holidays, golden holidays and an average day | Jan. 2019 ~ Jun. 2020, from 3AM for 24 hours, no. of calls per day (hourly)

Top 20 destinations originated from Seoul after working hours

Average number of calls daily, on hourly basis
Jan. 2019 ~ Jun. 2020

Weekdays

Rank	Address	Destination
1	Yongsan, Seoul	Seoul Station
2	Yongsan, Seoul	Itaewon Station (Line 6)
3	Gangnam, Seoul	Gangnam Station (Line 2)
4	Seocho, Seoul	Seoul Express Bus Terminal (Gyeongbu)
5	Gangnam, Seoul	Suseo Station
6	Mapo, Seoul	Hongdae Univ. Station (Line 2)
7	Jung-gu, Seoul	Theot Fashion Mall
8	Yeongdeungpo, Seoul	Yeongdeungpo Station
9	Gwanak, Seoul	Sillim Station (Line 2)
10	Yongsan, Seoul	Yongsan Station
11	Guro, Seoul	Guro Digital Complex Station (Line 2)
12	Gwangjin, Seoul	Konkuk Univ. Station (Line 2)
13	Gwanak, Seoul	Seoul Nat'l Univ. Station (Line 2)
14	Gangseo, Seoul	Gangseo-gu Office
15	Seongbuk, Seoul	Sungshin Women's Univ. Station (Line 4)
16	Gwanak, Seoul	Sadang Station (Line 2)
17	Nowon, Seoul	Nowon Station (Line 4)
18	Seodaemun, Seoul	Sinchon Station (Line 2)
19	Eunpyeong, Seoul	Yeonsinnae Station (Line 3)
20	Gangbuk, Seoul	Suyu Station (Line 4)

On the previous day of golden holidays

Rank	Address	Destination
1	Yongsan, Seoul	Seoul Station
2	Seocho, Seoul	Seoul Express Bus Terminal (Gyeongbu)
3	Yongsan, Seoul	Itaewon Station (Line 6)
4	Gwangjin, Seoul	East Seoul Intercity Bus Terminal
5	Seocho, Seoul	Central City Terminal (Honam)
6	Gangnam, Seoul	Suseo Station
7	Yongsan, Seoul	Yongsan Station
8	Gangnam, Seoul	Gangnam Station (Line 2)
9	Mapo, Seoul	Hongdae Univ. Station (Line 2)
10	Yeongdeungpo, Seoul	Yeongdeungpo Station
11	Seocho, Seoul	Seoul Nambu (South) Bus Terminal
12	Gwangjin, Seoul	Konkuk Univ. Station (Line 2)
13	Gangseo, Seoul	Gangseo-gu Office
14	Guro, Seoul	Guro Digital Complex Station (Line 2)
15	Jung-gu, Seoul	West Seoul Station
16	Gwanak, Seoul	Sillim Station (Line 2)
17	Nowon, Seou	Nowon Station (Line 4)
18	Gwangmyeong, Gyeonggi	Gwangmyeong Station
19	Yongsan, Seoul	Hamilton Hotel
20	Songpa, Seoul	Bangidong Food Street

On the previous day of national holidays

Rank	Address	Destination
1	Yongsan, Seoul	Itaewon Station (Line 6)
2	Yongsan, Seoul	Seoul Station
3	Gangnam, Seoul	Gangnam Station (Line 2)
4	Seocho, Seoul	Seoul Express Bus Terminal (Gyeongbu)
5	Gwanak, Seoul	Sillim Station (Line 2)
6	Yeongdeungpo, Seoul	Yeongdeungpo Station
7	Guro, Seoul	Guro Digital Complex Station (Line 2)
8	Mapo, Seoul	Hongdae Univ. Station (Line 2)
9	Gangnam, Seoul	Suseo Station
10	Yongsan, Seoul	Yongsan Station
11	Gwanak, Seoul	Sadang Station (Line 2)
12	Gangseo, Seoul	Gangseo-gu Office
13	Gwangjin, Seoul	Konkuk Univ. Station (Line 2)
14	Yongsan, Seoul	Hamilton Hotel
15	Gwanak, Seoul	Seoul Nat'l Univ. Station (Line 2)
16	Seodaemun, Seoul	Sinchon Station (Line 2)
17	Seocho, Seoul	Sinnonhyeon Station (Line 9)
18	Seongbuk, Seoul	Sungshin Women's Univ. Station (Line 4)
19	Jung-gu, Seoul	Theot Fashion Mall
20	Songpa, Seoul	Bangidong Food Street

COVID-19
SPECIAL SECTION

/ Changes in mobility pattern since COVID-19

/ Kakao T gaining more attention in the untact era

COVID-19 SPECIAL SECTION

/

Changes in mobility pattern since COVID-19

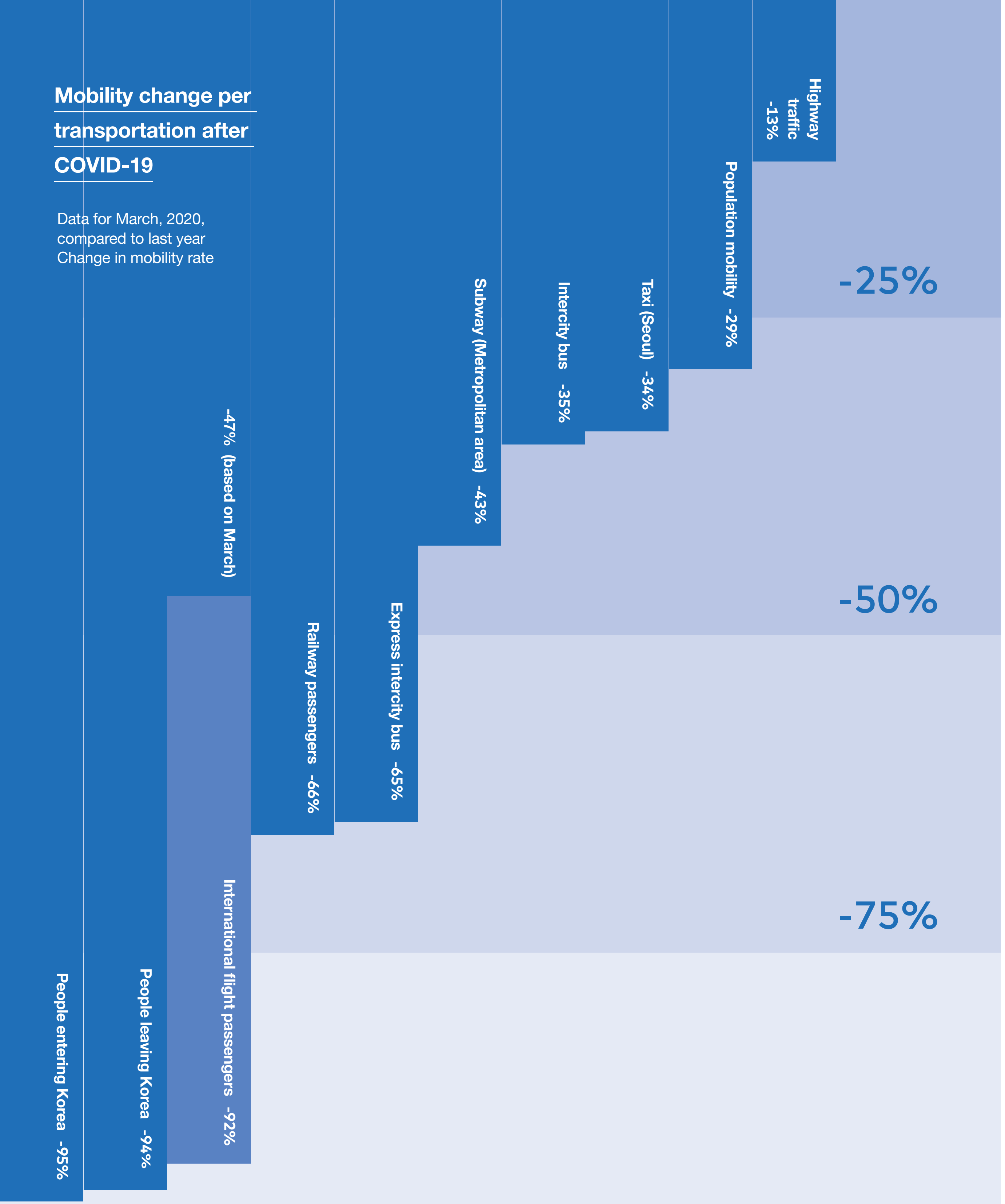
COVID-19 pandemic and changes in mobility

We have been continuously moving for a long time until the emergence of a new pandemic. With the situation being prolonged, a new pattern of mobility has started in our lives. Kakao Mobility has looked at the changes of mobility after the emergence of COVID-19 through the mobility data. How will the post-COVID mobility unfold?

Mobility plummeted unprecedentedly in March, 2020 when the COVID-19 pandemic was announced as a global pandemic. There are some differences depending on the types of transportation, but the total number of mobility has decreased to one-tenth of pre-COVID period. The total number of passengers taking international flights were reduced by 47% compared to last year and even decreased by 92% in April when the pandemic came into full effect. In Korea, there was a group infection case in Daegu in February, which affected the number of people leaving and entering Korea in March. As a result, the numbers have decreased by 94% and 95% compared to last year, respectively. Railways had got a blow as well, seeing 66% decrease in the number of passengers while express bus & intercity bus passengers were decreased by 65% in March, compared to last year. As for the metropolitan transportations, subways, intra-city buses, and taxis (Seoul, 1st week of March) marked 43%, 35% and 34% of decrease respectively in the number of passengers in March. Highway traffic has decreased by 13%. According to the big data accumulated by mobile operators, the National Statistical Office announced that the population mobility decreased by 29% in March 2020 (average of data from every Saturday) compared to last year. All mobility - regardless of inter-country, intercity and within the city - has significantly decreased.

Mobility change per transportation after COVID-19

Data for March, 2020, compared to last year Change in mobility rate



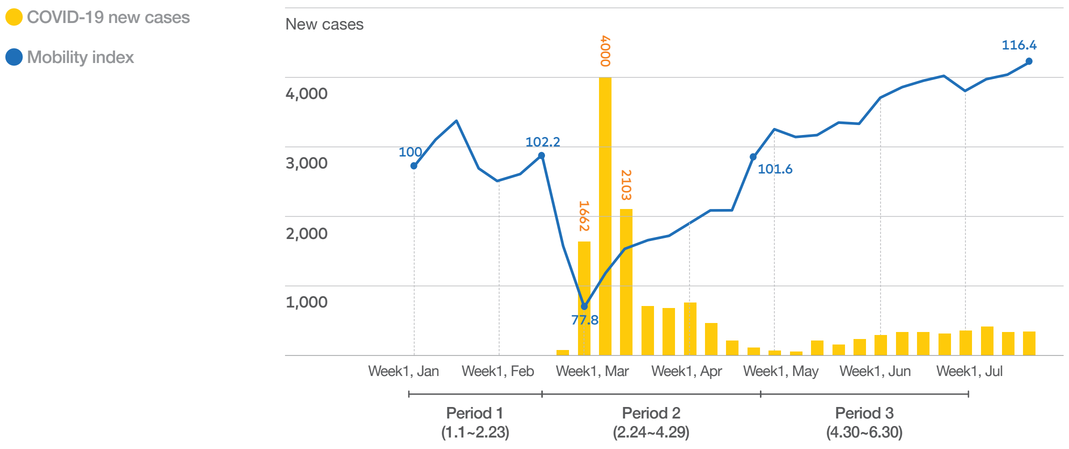
- Source: ICAO (International Civil Aviation Organization), Korea Tourism Organization, Korea Railroad Corporation, Ministry of Land, Infrastructure and Transport, Seoul Institute of Technology, and National Statistical Office
- International flight passengers data is based on April, Taxi data is based on the 1st week of March, population mobility data is based on the average data from Saturdays in March

Mobility changes after COVID-19

COVID-19 started to affect mobility as the number of confirmed cases rapidly increased. However, mobility did not stop for long. After a sharp decrease, mobility quickly regained its vitality. Mobility index, which shows weekly changes in the number of mobility by indexing the number of Kakaonavi usage in the 1st week of a month to 100, clearly shows this trend.

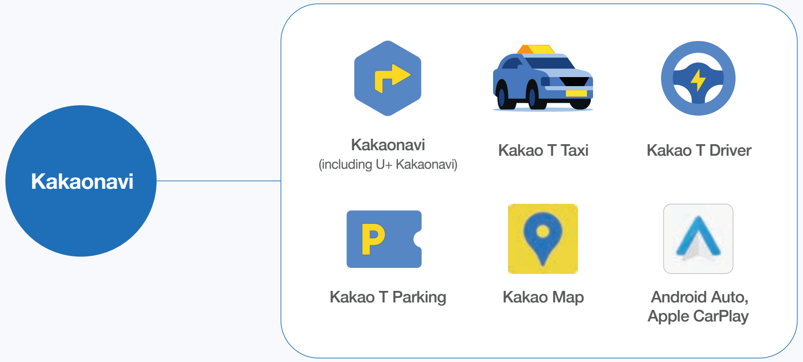
Mobility index is roughly divided into three periods. The first period is from the first week of January to the third week of February, when COVID-19 first occurred in China and the first confirmed case was witnessed in Korea. There was not much change in mobility during this period. The second period is from the fourth week of February to the first week of May, when a group infection was reported in Daegu and mobility rapidly declined then. Mobility was at its bottom in the first week of March, but soon gained momentum and recovered to pre-COVID level in the first week of May. The third period is when several more group infections in the metropolitan area (including Itaewon and logistics centers) occurred despite social distancing, thus entering the prolonged period of COVID-19. In this period, the mobility index continued to recover, but its speed was not as fast as that of period 2. From now on let's go into details on the post-COVID mobility data based on Kakaonavi and Kakao T Taxi data. This report will also look into the changes in traveling patterns, provided by the Korea Tourism Organization.

Mobility index trend based on Kakaonavi data and the no. of new COVID-19 cases



- Mobility index trend based on Kakaonavi data and the no. of new COVID-19 cases | Mobility index is based on Week 1 of January, 2020. Week 1 data is set to 100. No. of new cases is weekly total.

Distinct feature of mobility index based on data from Kakaonavi



Kakaonavi takes a prominent position in that it captures the pattern of mobility occurring in various contexts. When you look at the user base of Kakaonavi, they do not only use Kakaonavi. Mobility services such as Kakao T Taxi, Kakao Map and Kakao T Driver also use Kakaonavi for route guidance. Besides, Korea's no.1 map app Kakao Map uses Kakaonavi for route guidance.

In order to provide route guidance service to more users, we have partnered with LG U+ to launch U+ Kakaonavi and launched the third-party navigation service to support Google's Android Auto and Apple Carplay for the first time in Korea. Kakaonavi contains a special context of mobility that other navigations do not have and it also has a wide user base, which is perfect for providing differentiated insights for post-COVID mobility changes.

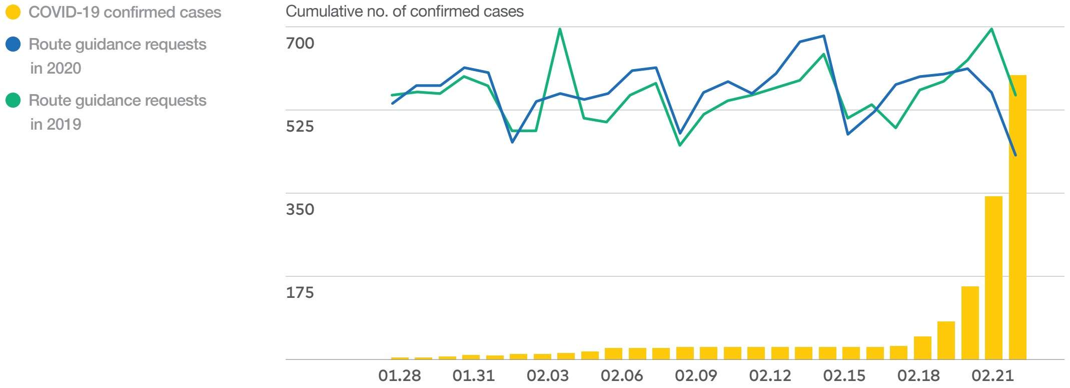
"New normal" era seen through Kakaonavi data

**Period 1.
Before the crisis alert rose to "Serious" stage**

Korea saw its first COVID-19 confirmed case on January 20, 2020. But the mobility trend did not change much from last year. With the report of the first patient, the government changed the health crisis alert to "Caution" from "Attention" but mobility still did not change during the New Year holidays in late January.

However, mobility started to change since February 23, 2020 when the alert was raised to "Serious". To be exact, change has begun on the day before the announcement of the new alert level. It was Friday, when the number of route guidance requests usually increased. But with the number of new confirmed cases exceeding 100, the number of requests has decreased during weekends.

No. of COVID-19 confirmed cases and Kakaonavi usage (Period 1, after the New Year holidays)



• No. of COVID-19 confirmed cases and Kakaonavi usage (Period 1, after the New Year holidays) No. of daily Kakaonavi route guidance starts, national data, compared to the same week of last year. Source: KDCA (Korea Disease Control and Prevention Agency)

Mobility gradually reduced day by day

Decrease in the number of route guidance requests was a national and local trend, while the timing of decrease was somewhat different by each region. The first region that saw the decrease was Daegu. The decrease started even three days earlier than the national data. This is because a severe group infection has struck Daegu first and travelling to other regions was restricted.

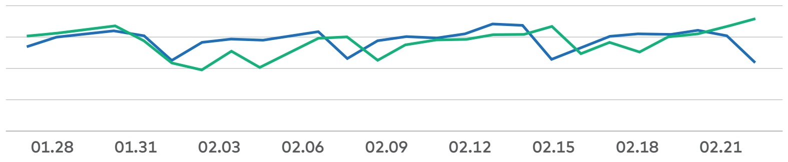
Later on COVID-19 spread to Gyeongbuk and the metropolitan area, causing reduction in mobility. On the 23rd of February, the government raised the alert level to “Serious” and the number of route guidance request was observed to be ⅓ of normal level (other regions were ⅔). Reduction in mobility has continued for a long time since.

No. of Kakaonavi usage per region (Period 1, after the New Year holidays)

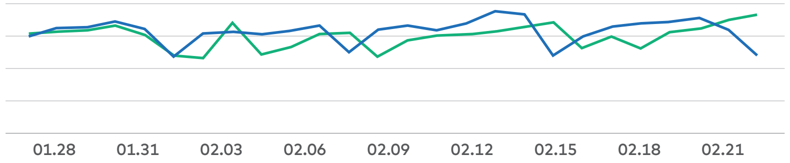
● Route guidance requests in 2020

● Route guidance requests in 2019

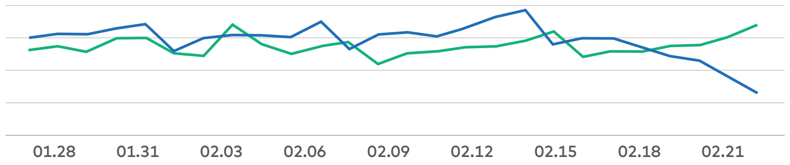
Seoul



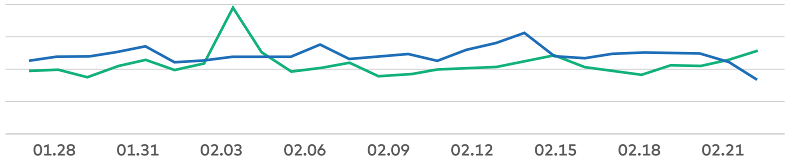
Gyeonggi



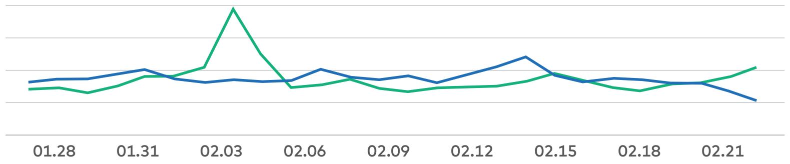
Daegu



Gyeongnam



Gyeongbuk



• No. of daily Kakaonavi route guidance starts, compared to the same week of last year

Period 2. Population mobility reduced, mobility limited to essential movement

February 24th is the beginning of Period 2. People strived to keep social distancing amidst the wide-spreading COVID-19. According to Kakaonavi’s data, during this period mobility was reduced by up to 28.9% per day compared to last year. This trend continued until late April when the number of confirmed patients per day has become a one digit number.

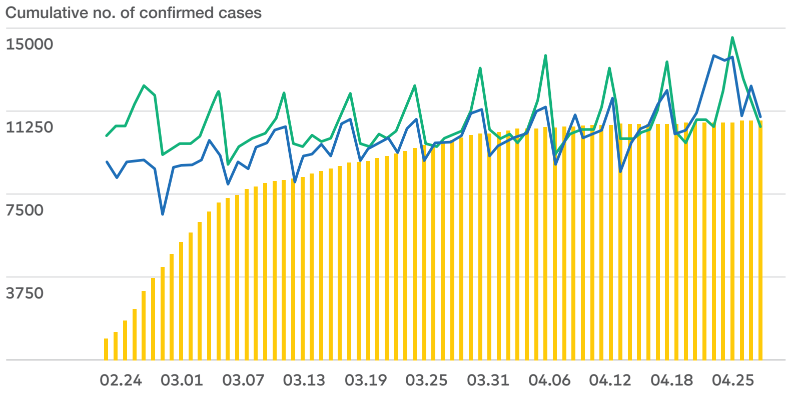
According to the route guidance request data, requests to major indoor facilities have decreased compared to Period 1. Since this period is quite long, we have limited the data scope to three weeks from February 23 to compare with Period 1. As a result, it was observed that visits to major indoor facilities including bookstores, mega shopping malls, department stores, movie theaters, cultural facilities, and religious facilities were decreased compared to Period 1. In particular, visits to cultural facilities, movie theaters and religious facilities were decreased by more than 40%. Based on this result, it is safe to say that people stopped visiting most of the places and occasionally went to coffee shops.

No. of COVID-19 confirmed cases and Kakaonavi usage (Period 2)

● COVID-19 confirmed cases

● Route guidance requests in 2020

● Route guidance requests in 2019



Mobility changes by each major destination category (Based on March data)

Category	Rate of change (compared to previous month)
Food | Cafe	22.3
Food | Snacks	4.9
Travel | Sightseeing, attraction points	3.6
Culture & Arts | Books	-14.1
Living & Life | Mega shopping malls	-19.3
Living & Life | Department store	-27.2
Culture & Arts | Movie theaters	-30.7
Culture & Arts | Cultural facilities	-46.5
Culture & Arts | Regional facilities	-54.5

• No. of daily Kakaonavi route guidance starts, compared to the same week of last year. Source: KDCA

Hot places for people who were afraid of COVID-19

When looking at the changes in top destinations during Period 1 and 2, it is easy to observe the pattern of mobility reduction caused by COVID-19. Major facilities including department stores, airports and movie theaters showed reduced mobility on weekdays and weekends alike. Instead, new destinations were included in the top 100 POIs for weekends such as Eulwangri Beach (25th), Sorae Pogu Fish Market (34th), Dumulmeori (36th), Sokcho Tourist & Fishery Market (39th), Daecheon Beach (47th), Yeouido Hangang Park (48th), and Gwanggyo Lake Park (56th), indicating people preferred outdoors to crowded area. Additionally, an unusual movement of people heading to the Agency for Traditional Market Administration and IBK to get financial aid was captured in the data.

Rank changes in top destinations during Period 1 & 2

Weekends			Weekdays		
Destination	Rank in Period 1	Rank in Period 2	Destination	Rank in Period 1	Rank in Period 2
Lotte Dept. Store	4	7	Lotte Dept. Store	6	9
Hyundai Dept. Store	10	12	Hyundai Dept. Store	12	13
Shinsegae Dept. Store	11	14	Shinsegae Dept. Store	18	20
Incheon Int'l Airport	9	26	Incheon Int'l Airport	5	30
CGV	8	20	CGV	14	31
Lotte Cinema	21	40	Lotte Cinema	38	51
Mega Box	22	51	Mega Box	41	64

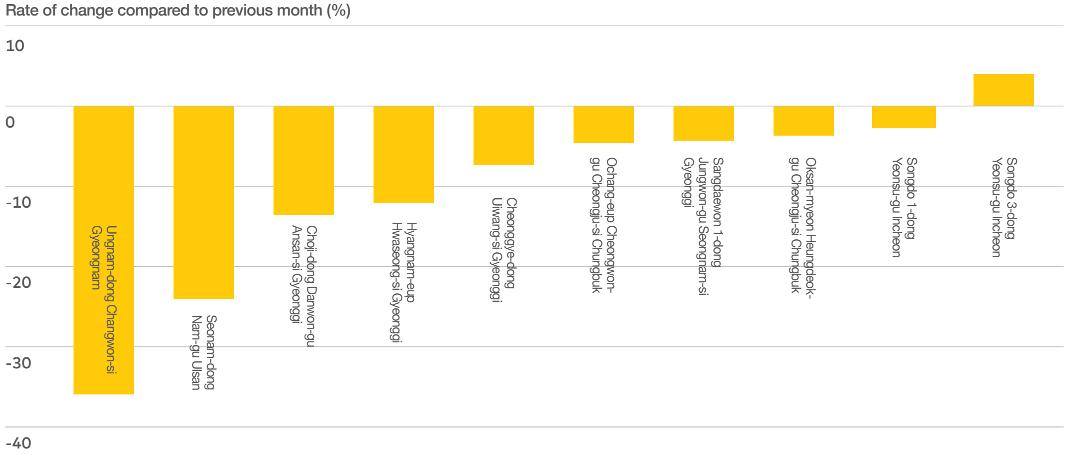
• Rank changes in top destinations during Period 1 & 2 | Based on the no. of Kakaonavi route guidance starts, comparison excludes period from the beginning of 2020 to New Year holidays

COVID-19 changing our working style

During Period 2, new working styles such as work-from-home, work in shifts, and flexible working hours have become a hot topic and this was observed in Kakaonavi's data. We compared the number of route guidance requests by categorizing destinations of each administrative district. Data period was three weeks (including before and after February 24), between 7am to 10am to see only commuting data. The results were compared by each industry.

For factory industrial areas, some factories were closed due to COVID-19 but the others showed commuting patterns similar to that of pre-COVID period. The top 10 destinations under the 'Factory' category (based on eup, myeon and dong) showed either big reduction in mobility or no changes at all. Mobility for Choji-dong (Gyeonggi, Ansan), Sangdaewon 1-dong (Gyeonggi, Seongnam), Cheonggye-dong (Gyeonggi, Uiwang), Songdo 1-dong (Incheon), Songdo 3-dong (Incheon), Ochang-eup (Chungbuk, Cheongju) was reduced by less than 10% or even increased in some regions. On the other hand, places in southern areas such as Ungnam-dong (Gyeongnam, Changwon) and Seonam-dong (Ulsan) showed 20~30% decrease in mobility, which indicates the huge impact of COVID-19 that struck the region during this period.

Mobility changes in major factory industrial areas (March 2020)



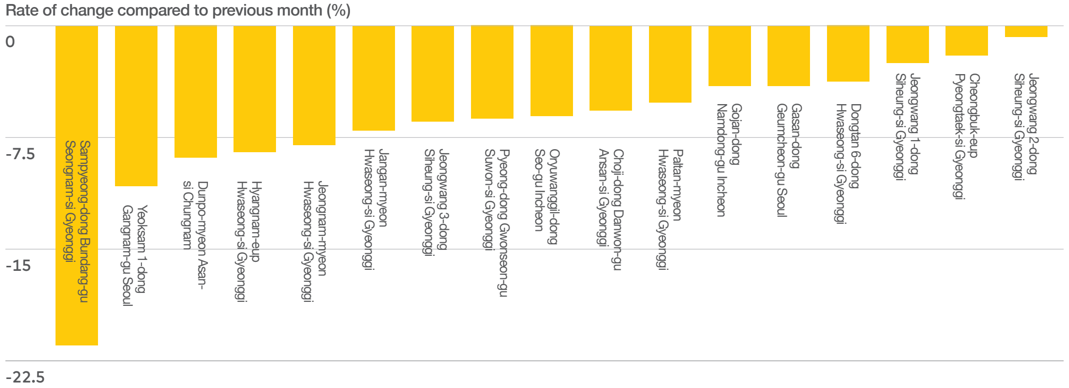
• Mobility changes in major factory industrial areas (March 2020) | Based on factory category and no. of Kakaonavi route guidance starts

Pangyo, a hub for IT companies, has the highest rate of work-from-home employees

Let's expand the scope to include business and office areas to see mobility data in major business districts in Korea. By doing so, we could estimate the impact of 'work-from-home' to each industry. Many IT companies are located in Pangyo (Seongnam-si, Bundang-gu, Sampyeong-dong) and Gangnam (Gangnam-gu, Yeoksam 1-dong) and although these companies were not seriously affected by COVID-19, still mobility was greatly reduced. On the other hand, factory industrial areas including Guro, Siheung, Suwon and Hwaseong showed relatively small reductions in mobility.

During March when COVID-19 started to spread rapidly, IT companies chose to work from home. However, for factories which cannot stop the operation for a long time showed no difference in working patterns.

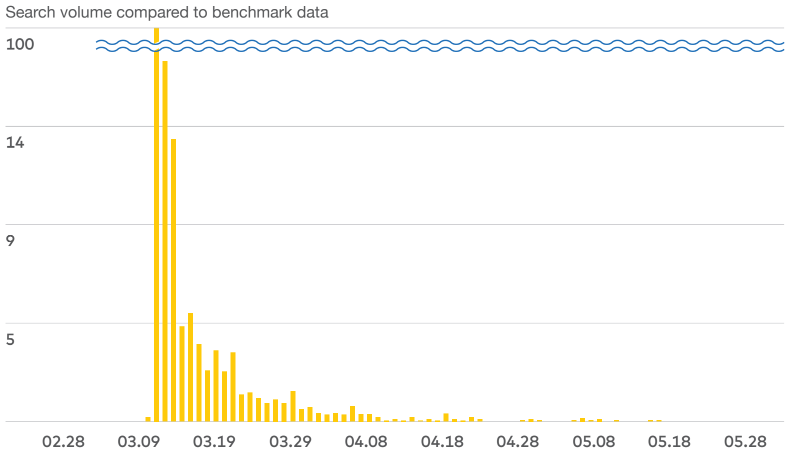
Mobility changes in major business areas (March 2020)



Search volume for public mask sellers increased

Kakaonavi, together with Kakao Map, started a real time mask availability notification service on March 11. By setting the search volume on March 11 as a benchmark of 100, the following search trend was shown. At the beginning of the service, search was mainly about where to buy public masks but the volume gradually decreased because people did not need that information anymore. But it was continuously searched until April 27 when the mask purchase limit was raised.

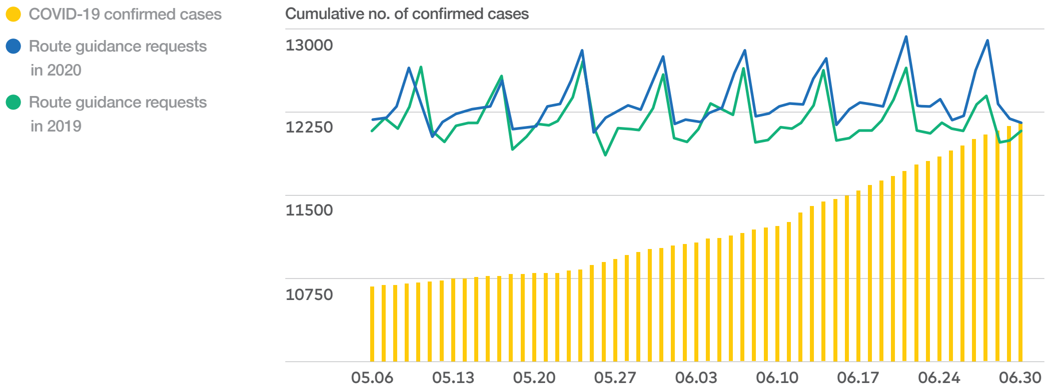
Number of "public masks" searched within Kakaonavi



Period 3. Mobility pattern in new normal era

After the long vacation from April 30 ended on May 5, people started to get back to their ordinary lives while social distancing was eased. The number of route guidance requests from May 6 was similar to that of last year and this trend has continued since. This may seem like people resumed their activity to the pre-COVID level, but when you look at it in more detail you might be able to see a different pattern - a new normal pattern.

No. of COVID-19 confirmed cases and Kakaonavi usage (Period 3)



• Mobility changes in major business areas (March 2020) | Based on service & industry category (including factory) and no. of Kakaonavi route guidance starts

• No. of "public masks" searched within Kakaonavi | Based on Kakaonavi benchmark data (March 11)

• No. of COVID-19 confirmed cases and Kakaonavi usage (Period 3) | No. of daily Kakaonavi route guidance starts, compared to the same week of last year, Five days (April 30 ~ May 5) were excluded from Period 3 data due to increase in mobility during the holidays. Source: KDCA

Less indoor activities, more domestic travel

Number of visits to department stores, shopping malls and bookstores have recovered and even exceeded the reductions in Period 1. It can be assumed that more and more people started visiting places that were previously restricted during social distancing. Also, a large number of people chose to travel within Korea as they could not go abroad which resulted in increased visits to cultural facilities and tourist attractions in Period 2. However, visits to bookstores, cultural and religious facilities decreased in Period 3 just to the level of Period 1 and showed no big recovery compared to last year. Visits to movie theaters have decreased again in Period 3, marking a 67% decrease compared to last year.

Mobility changes in top destinations by category (changes per period)

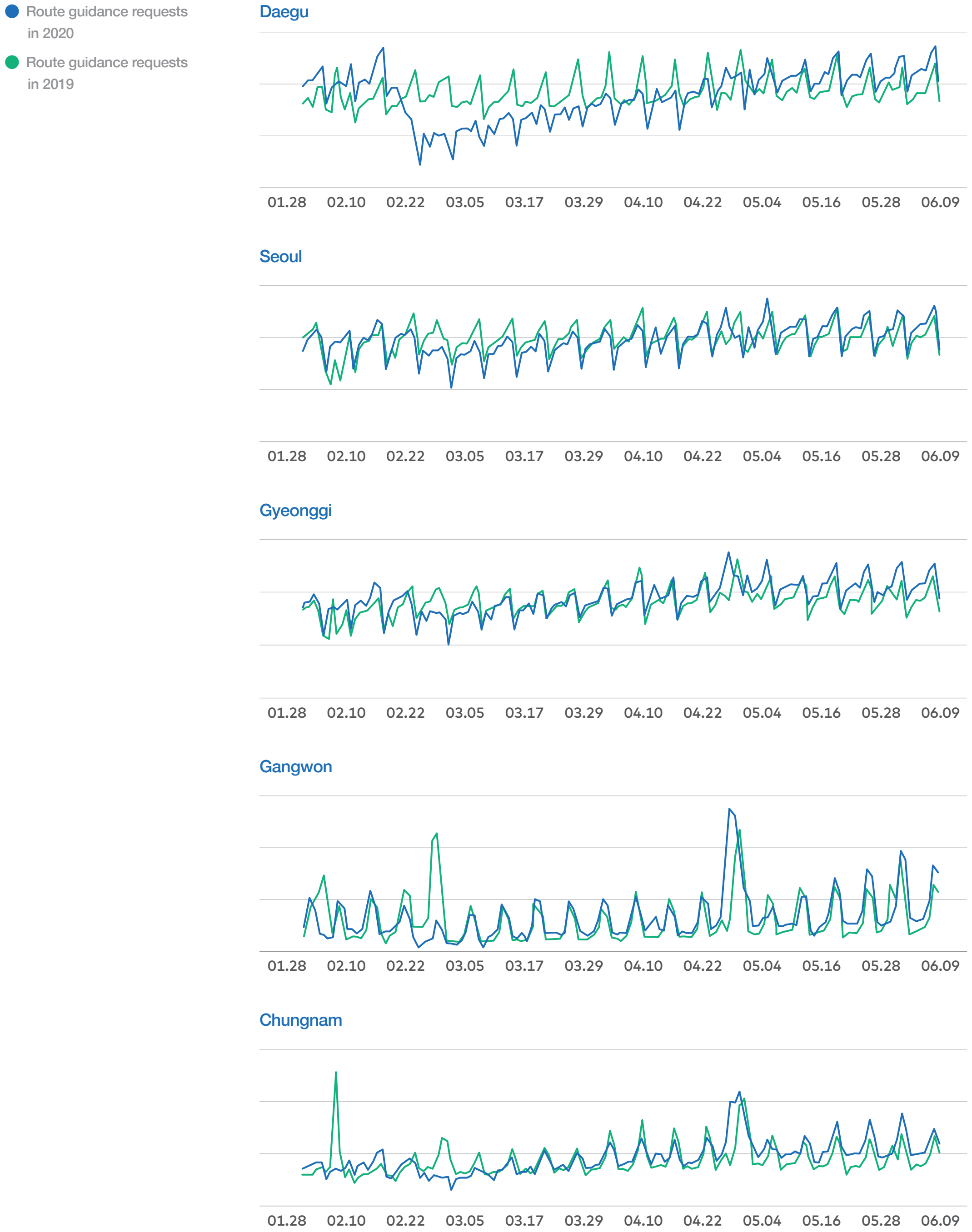
Category	Changes in Period 2	Changes in Period 3	
	Compared to Period 1	Compared to Period 2	Compared to last year (YoY)
House & Living | Department store	-17.1	32.1	-5.6
House & Living | Shopping malls	-6.3	22.5	-8.7
Culture & Art | Books	-7.1	14.6	-11.6
Culture & Art | Cultural facilities	-43.8	129.3	-25.6
Culture & Art | Movie theaters	-45.2	-17.8	-67.9
Culture & Art | Religious facilities	-21.8	36.5	-18.8
Travel | Tourism, attraction points	23.8	17.9	-0.9
Food | Snacks	33.8	25.6	0.1
Food | Cafe	6.5	-11.9	-23.2

Daegu recovering from COVID-19

Daegu is one of the hardest hit areas by COVID-19. When you look at the graph that shows the number of route guidance requests from Daegu during the three periods, the number plunges in the early stage of Period 2 and shows the biggest gap when compared with the data in 2019 at the end of Period 2. Mobility still hasn't recovered much in Period 3, whereas other regions including Gyeonggi have seen more mobility compared to last year.

• Mobility changes in top destinations by category (changes per period) | Based on the no. of Kakaonavi route guidance starts, data from the beginning of 2020 to New Year holidays excluded from Period 1, data for five days (April 30 ~ May 5) excluded from Period 3 due to a sharp increase in mobility during the holidays and no. of Kakaonavi route guidance starts

Kakaonavi usage trend by region



• Kakaonavi usage trend by region | No. of daily Kakaonavi route guidance starts, compared to the same week of last year

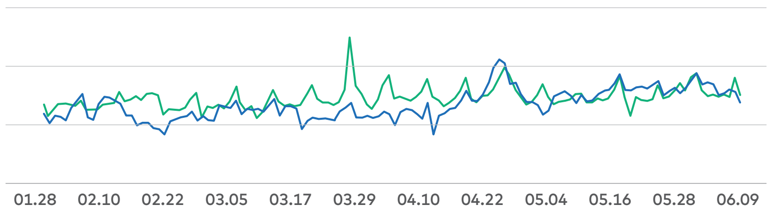
Domestic travel becomes all the more popular

With summer approaching, people started to look up for vacation spots and domestic traveling became more popular than ever this year. This trend can be found in the number of visits to each region and POI ranking. Jeju and Busan which are the most famous destinations in Korea showed an increased number of visits during Period 3. In particular, the number of visits on weekdays has increased compared to last year, indicating that the overall number of travelers has increased.

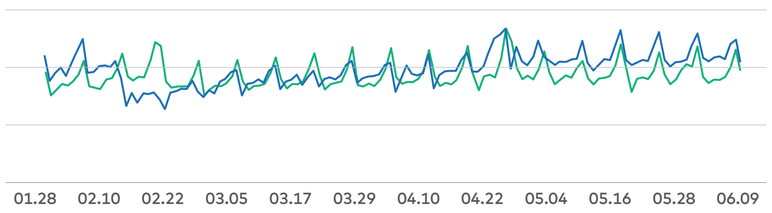
Kakaonavi usage by region

- ● Route guidance requests in 2020
- ● Route guidance requests in 2019

Jeju



Busan



When we look at the POI ranking, Incheon International Airport took the third place in 2019 but it fell to 65th this year and Gimpo International Airport was ranked higher than Incheon Int'l Airport. Meanwhile, Yeouido Hangang Park and Eulwangri Beach took higher places than before with more people visiting due to COVID-19.

Rank changes in major airports and travel destinations (Period 3)

Destination	2019	2020	Changes
Incheon Int'l Airport	3rd	65th	-62
Gimpo Int'l Airport	16th	28th	-12
Jeju Int'l Airport	66th	66th	–
Yeouido Hangang Park	220th	159th	+61
Eulwangri Beach	228th	160th	+68

· Kakaonavi usage trend by region | No. of daily Kakaonavi route guidance starts, compared to the same week of last year
· Rank changes in major airports and travel destinations | No. of daily Kakaonavi route guidance starts, first five days (April 30 ~ May 5) were excluded from Period 3 data due to a sharp increase in mobility during the holidays

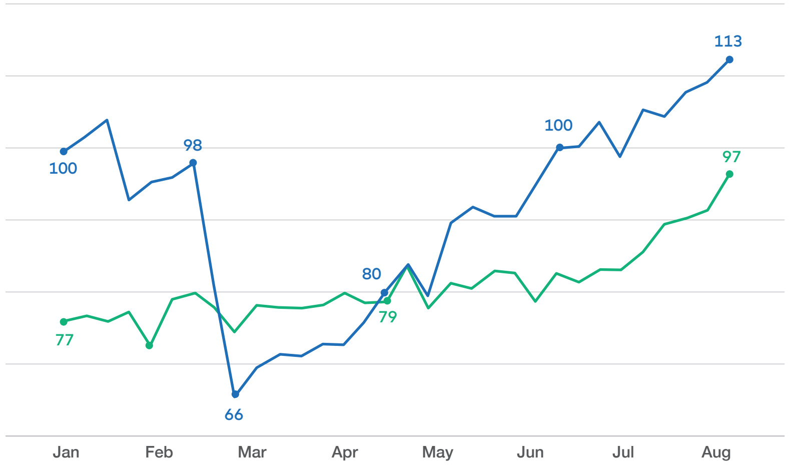
How did COVID-19 affect the taxi users?

How did COVID-19 affect the taxi users? Let's look at the Kakao T Taxi usage trend in 2019 and 2020 . The following graph shows the weekly changes on the number of Kakao T Taxi usage by comparing with the data of Week 1, January 2020.

Changes in the no. of taxi usage since COVID-19

- ● No. of taxi usage in 2020
- ● No. of taxi usage in 2019

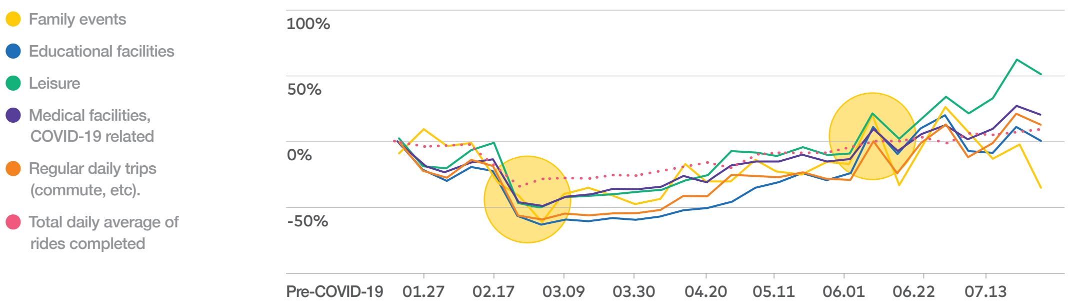
Weekly usage of Kakao T Taxi



· Changes in the no. of taxi usage since COVID-19 | Based on the no. of rides completed, compared to 1st week of Jan. 2020

Changes in the no. of taxi usage by the purpose of trips

Changes in the number of usage (compared to the 1st week of Jan. 2020)



Period 1.
The advent of COVID-19

Taxi usage decreased slightly overall and recovered to normal level in early February. In detail, COVID-19 did not affect family events at all while leisure was affected, but recovered to pre-COVID level at the end of February. People were not so aware of COVID-19 just yet.

Period 2.
Increase of COVID-19 patients

Taxi industry was hit hard due to COVID-19 during this period, as health alert was heightened to “Serious” level and social distancing has been widely adopted. People started to restrict their movement outdoors. The number of rides completed daily nationwide dropped by 30% on average compared to pre-COVID times. The most affected area was educational facilities and regular daily trips mainly due to work-from-home and home study (about 50% decrease on average compared to pre-COVID times). Next, as the government recommended not to visit hospitals as a way of preventing COVID-19, the number of trips to hospitals has decreased by almost 50%. Taxi usage rate continued to decline for the fear of COVID-19 until early March but slowly rebounded since then.

Period 3.
Changes in our daily lives with COVID-19

Now that people are admitting that COVID-19 is something you have to live with, taxi usage slowly recovered while people continued to strictly adhere to safety practices. Starting from Period 3, all visits have recovered to pre-COVID level although there was one hiccup in June when group infections occurred in Itaewon clubs and large logistics centers. But the trend soon recovered in July to pre-COVID level. To breakdown the data, taxi usage for leisure was recovered most quickly in June and continued its momentum to marking a 50% higher number than pre-COVID period in July. Next came education facilities, which increased quickly at the end of May to normal level as all schools were reopened.

In conclusion, people’s awareness on COVID-19 was directly reflected in taxi usage patterns, and taxi has once again become a major transportation for people since the end of Period 3 when people started to accept COVID-19 in their daily lives.

• Changes in daily taxi usage by the purpose of trips | Based on data from Jan.1 ~ 20, 2020. Daily average of Kakao T Taxi’s rides completed

Kakaomobility
x
Korea Tourism organization

A whole new way to travel in the COVID-19 era

Have you ever heard of “hwakjjinja” which refers to people who have gained weight during shutdowns and social distancing? COVID-19 has greatly influenced our lives to coin so many neologisms such as “phantom corona”, “corona blue”, “untacted”, and “golsk (gold + mask)”. With social distancing becoming a norm, the travel industry has joined in this trend as well, and their pain began. To see what hardships the industry is going through, we have investigated the famous travel destinations in Korea from January (when the first patient was confirmed) to March (when the number of confirmed exploded) by using Kakaonavi data.

No more indoor activities and keeping distance during traveling

Destinations that suffered the biggest loss were ‘indoor’ focused travel destinations. Compared to the pre-COVID times, visits to indoor destinations dropped by 36%. Considering that the average decrease is 13% for top 100 destinations in total, this number shows how much people felt unsafe about indoor destinations. The next hard hit destinations were ‘indoor destinations providing partial outdoor activities’, ‘outdoor destinations providing partial indoor activities’, and ‘outdoor destinations’ in order.

No. of visits by destination type (Jan ~ Mar 2020)

Rank	Destination type	Change rate
1	Indoor	-36%
2	Indoor with partial outdoor activities	-33%
3	Outdoor with partial indoor activities	-29%
4	Outdoor	-7%
	Average	**-13%**

• No. of Kakaonavi route guidance starts, Jan ~ March 2020

Indoor destinations suffered the biggest loss

Among all travel destinations, places where you are likely to meet "the unknown crowd" more frequently had the hardest time. Traditional market is a prime example. People say you have to go to the local traditional market to feel the local vibe. That is true, and many travelers have visited traditional markets to meet the locals and to feel a somewhat unfamiliar but exciting mood that you get while traveling. But due to COVID-19 these unfamiliar encounters and experiences were considered as an unsafe behavior, causing a reduction in mobility by 42% compared to pre-COVID times. Moreover, as many indoor facilities including museums and exhibition halls were temporarily closed to prevent people from gathering, lots of cultural facilities and historical sites were struck with loss. On the contrary, outdoor destinations where you can enjoy leisure, various activities and nature, showed a slight decrease.

No. of visits by destination type (Jan ~ Mar 2020)

Rank	Destination type	YoY changes
1	Hot springs & spa resorts	-45%
2	Traditional markets	-42%
3	Exhibitions & cultural facilities	-41%
4	Historical sites	-41%
5	Unique streets/villages	-39%
6	Theme parks	-33%
7	Misc.	-23%
8	Beaches	-20%
9	Nature & scenery	-15%
10	Leisure & activities	-12%

Bye bye, popular destinations

COVID-19 stopped tourists from visiting the most popular travel destinations in Korea. When you look at the destinations that showed the biggest drop in visits after COVID-19, most of them were popular local destinations. This is because people felt unsafe about popular destinations and tried to keep distance.

Unique places including Ikseondong and Incheon China Town were very popular in the pre-COVID times but each marked 71% and 67% of reduction (YoY) in the number of visits respectively. Gunsan Modern History Museum which is considered as the treasure of modern history in Gusan, and DDP (Dongdaemun Design Plaza) which is the heart of Dongdaemun, saw 67% and 64% reduction in the number of tourists respectively. Not only that, Busan Jagalchi Market which is the most famous attraction in Busan, Bulguksa which turned a famous school trip destination into the hippest tourist attraction, and the number 1 must go GyeongbokGung in Seoul each had 64%, 60% and 59% decrease in the number of tourists.

No. of visits by destination type (Jan ~ Mar 2020)

Destination type	Destination type	YoY changes
Hongcheon Vivaldi Park	Leisure & Activities	-56%
Hallyeosudo View Cable Car	Leisure & Activities	-54%
Gunsan Modern History Museum	Exhibitions & Cultural facilities	-67%
DDP (Dongdaemun Design Plaza)	Exhibitions & Cultural facilities	-64%
Independence Hall of Korea (Cheonan)	Exhibitions & Cultural facilities	-59%
World Trade Center Seoul (COEX)	Exhibitions & Cultural facilities	-57%
Bulguksa (Gyeongju, UNESCO World Heritage Site)	Historical sites	-60%
GyeongbokGung	Historical sites	-59%
Gyeongju Donggung Palace and Wolji Pond	Historical sites	-53%
Ikseondong	Unique streets/villages	-71%
Incheon China Town	Unique streets/villages	-67%
Busan Gamcheon Culture Village	Unique streets/villages	-58%
National Institute of Ecology (Seocheon)	Nature & scenery	-62%
Daewangam Park	Nature & scenery	-57%
Busan Jagalchi Market	Traditional markets	-64%
Busan International Market	Traditional markets	-60%
Daegu Seomun Market & Seomun Night Market	Traditional markets	-58%
Gwangjang Market	Traditional markets	-58%
Lotte World	Theme parks	-60%
Ecoland Theme Park	Theme parks	-57%
Seoul Land	Theme parks	-56%
Korean Folk Village	Theme parks	-55%

• No. of Kakaonavi route guidance starts, Jan ~ March 2020

• No. of Kakaonavi route guidance starts, Jan ~ March 2020

Untact travel destinations

Blow away your Corona Blue with safe, untact traveling

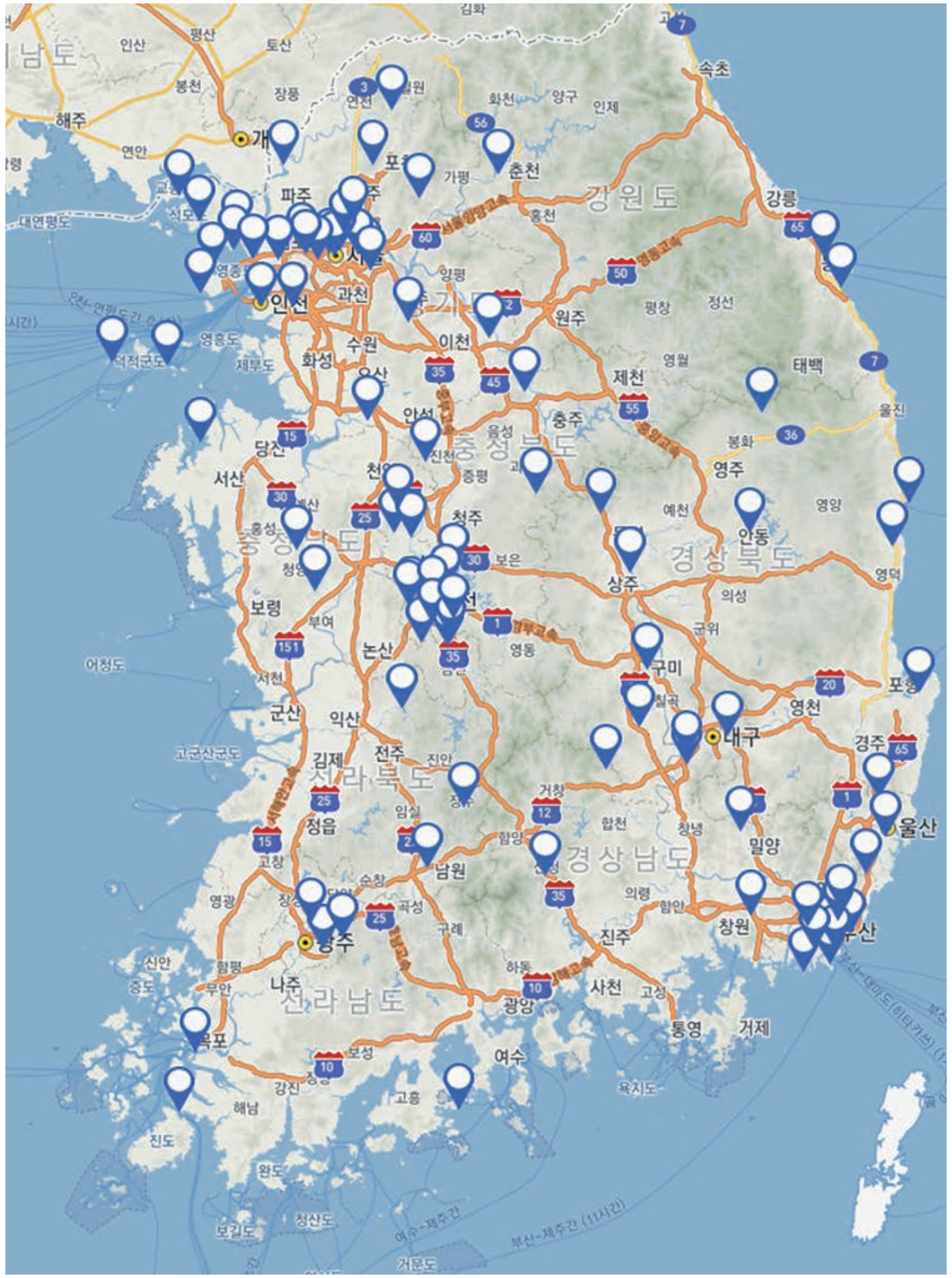
Gabriel Marcel, a French philosopher, defined human nature as 'always moving' as "Homo Viator". Traveling is a pure humanly behavior, and it is also their right.

But one day, COVID-19 came out of nowhere and jailed homo viators. However as we are also homo ludens (man the player), found joy and happiness even while staying at home making dalgona coffee and going on a virtual trip.

The problem is that this "stay-at-home" and "play alone" initiative is being extended longer than expected, boring out homo ludenses and homo viators. The boredom has now evolved into corona blue. We are still certainly afraid of the COVID-19, but isn't there a safe way to be a homo viator again?

From the data extracted from Kakaonavi, it was clear that people were afraid of crowded travel destinations. They were in desperate need of safer destinations. With the help of the Korea Tourism Organization, we now introduce the safe, untact travel destinations for homo viators.

Map of 100 Untact Destinations



①

Destination for Leisure & Activities

Deunggisan Skywalk in Uljin Running across the blue sky

The Deunggisan Skywalk, located in Uljin-gun, Hupo-myeon, is a bridge that lets you enjoy the sea and the sky at the same time. When you step on the bridge, you will feel like walking in the air with the sea right under your feet. There is also a beach (Gusan Beach) nearby where you can enjoy car camping. Want to enjoy green scenery while enjoying camping around the sea? Visit the Deunggisan Park.

Need a new excitement? Go to Hupo and meet the sky and the sea Deunggisan Skywalk is all about the amazingness

Before and after COVID-19

Before the COVID-19 era, the Deunggisan Skywalk was popular all year round but it was most crowded in May and August when the weather is nice or is hot during summer. But with COVID-19 breakout, the total number of travelers had dropped and those visiting the Skywalk decreased as well. But in the golden holidays in May, the number has greatly increased.

Recommended course

Blow away your Corona Blue by watching the wide, blue East Sea in front of the Deunggisan Skywalk. Cross the thrilling bridge and climb a hill to get to the Deunggisan Lighthouse Park. Taking pictures with various lighthouses from all over the world is a must! Then visit the fish market nearby to enjoy delicious snow crab from Uljin area at a price that is much cheaper than any other place.

Best time to visit

Deunggisan Skywalk is all about the sea and the sun so it is always a pleasant destination to visit if there is good sunlight! But if you are a person who is serious about skin care, avoid noontime during summer because obviously it is too hot. If you don't want to get crowded then we recommend around 4pm, and do avoid Saturdays as it is the most popular day of the week.

②

Destination for Exhibitions
& Cultural facilities

Odaeho Art Factory, a place for the rebellion of the discarded

Odaeho Art Factory is located at Yangsung-myeon in the northern outskirts of Chungju. It exhibits artworks made from recycled material and provides art experience programs. The building was once an elementary school (Neungam Elementary) but now it is reborn as a new, must-see destination in Chungju. Yangsung-myeon is also one of the wellness destinations in Korea famous for its hot springs that have the highest amount of carbonic acid in the water.

충주 오대호 아트팩토리

Waste becomes art
Art as experience!

Factory for all
Kids, mom & dad
Grandma & grandpa
Lovers and friends!

Before & after COVID-19
Since its grand opening in May 2019, Odaeho Art Factory was seeing a steady number of visitors. However, the number started to decrease from January due to the outbreak until March when the number of confirmed cases has radically increased. But thanks to people who strictly followed the safety practices during the exhibitions and art experience programs and clean nature including Chungjuho and Namhangang, the Factory is now emerging as an untact traveling destination.

Recommended course
Enjoy the exhibition and art programs in the Odaeho Art Factory during the day, and visit Suanbo in the evening. Suanbo is famous for its hot spring water and you can enjoy a nice warm public foot bath in the 350m long “foot bath street” for free. The street has various foot bath facilities such as shiatsu and massage, helping you get relaxed after a long, tiring day.

Best time to visit
Odaeho Art Factory is closed on Mondays. All art experience programs are temporarily closed for now due to COVID-19, but when it resumes try visiting on Thursdays instead of Fridays when the place gets crowded. Also, it is best to leave your homes around 11am instead of 10am (opening hour) to avoid traffic.

③

Destination for Historical sites

Haenam Usuyeong, Be merry at Myeongryang

Usuyeong is located in a small town named Munnae-myeon in Haenam-gun, Jeonnam. It was a strategic point in the great battle of Myeongryang and has plenty of historical and cultural facilities related to the battle. Selected as one of the tourist sites in Korea in 1987, Usuyeong is loved by many tourists for its nature, historical sites and various leisure activities. Visit Usuyeong to enjoy the nature of Namhae (South Sea) and feel the energy of the Myeongryang battle.

Haenam has more than Ttangkkeut Village

The cradle of the Myeongryang battle Attractive place beyond boring history

Before and after COVID-19

The number of visitors to Usuyeong started to decrease since the outbreak of the disease until March when the number of patients has rapidly increased. But it is still loved by many people; its blue-wide ocean and pure energy are the two main points that keep it attractive in the COVID-19 crisis!

Recommended course

There are many places to enjoy nearby Usuyeong including the Haenam Oceano tourist site, Chungmusa, Ganggangsullae Gil, etc. If you are done enjoying the sea and history, why not stimulate your five senses by traveling across the wide field in Haenam? To tip you off, Yeonhomaeul, which is famous for its barley field and the beautiful hydrangea field in Forest(4est) Arboretum are the two hot places in SNS.

Best time to visit

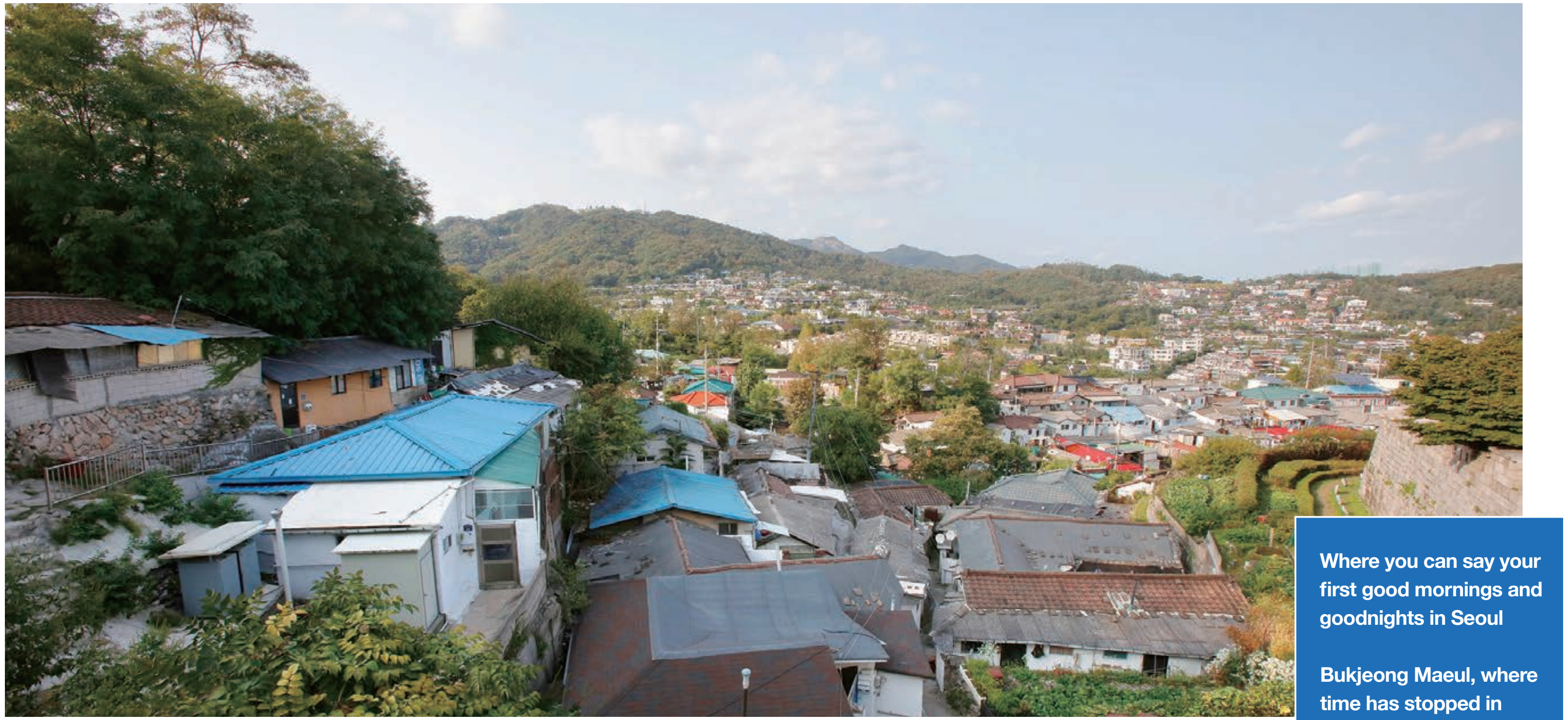
You may want to visit Usuyeong as early as possible since many leisure activities and cultural activities for children are prepared for visitors. If you are not interested in such activities and just want to look around the exhibitions and follow the trail nearby, somewhere after 10am will be a good time to leave your house.

④

Destinations for
Unique streets/villages

Bukjeong Maeul in Seongbuk How the time went by between the narrow alley

Bukjeong Maeul is located at Seongbuk-ro in Seoul. It is an old town with a nickname which is “the last shanty town in Seoul.” With the recent restoration being a huge success, Bukjeong Maeul has uniqueness all around the town, filled with people’s stories in every corner of the alley. For young people who enjoy adventuring small alleys, Bukjeong Maeul is a hidden gem where you can find a bookstore (currently relocated) with a unique “book curation” concept and friendly streets.



Where you can say your first good mornings and goodnights in Seoul

Bukjeong Maeul, where time has stopped in every corner

Before & after COVID-19

Bukjeong Maeul is a hidden gem visited by people who learned the place through word of mouth. The number of people visiting the quiet and charming town has rarely changed, making the comparison for before and after COVID-19 somewhat meaningless. However, the number started to decrease after June when group infections occurred in the metropolitan area.

Recommended course

Bukjeong Maeul has a trail that leads to Haneul Park and Seoul City Wall. If you want to enjoy walking among nature glowing with four different charms in each season, this course is a must. In addition to that, pretty cafes and restaurants are lined up in Seongbuk-dong, helping you to plan a perfect date.

Best time to visit

Bukjeong Maeul is one of the popular places to visit for night photo shoots in Seoul. Have an early dinner at one of the restaurants in Seongbuk-dong and leave around 7pm to avoid traffic. If you enjoyed walking around the trail during the day, then prepare for the beautiful and shining night view of Seoul.

⑤

Destination for Nature & leisure

Chuncheon Uiamho cycle path - health is the virtue romance is a bonus

Chuncheon Uiamho cycle path (Mulle-gil) is located at Sportstown-gil in Chuncheon, Gangwon. This path seems like a perfect match considering its road name, the ‘sports town’ road. Riding along this cycle path that connects Mulle-gil with Gongjicheon stream is a wonderful journey with a perfect view.
Do “Chuncheon” and “Uiamho” sound too 1990s to you? Then you got it wrong! The hottest keyword for today would be “health”, since COVID-19 is threatening our lives! Health and safety have become the best virtue these days. Considering this, a safe and healthy bike riding would be the “it” activity of all. Why not take your best bike item and enjoy a ride around the Uiamho? “Chuncheon Romance” will follow, too.

“Bring your Bike” on a train to Chuncheon healthy traveling with bike riding

Before and after COVID-19
Bike riding has gained interest since the emergence of COVID-19. Naturally, people are showing more interest in Uiamho Mulle-gil in Chuncheon. The number of riders who visited Uiamho in April (the best time to enjoy bike riding) increased by 100% compared to last year.

Recommended course
Uiamho Mulle-gil is also famous for canoeing. Did you enjoy the bike riding along the Mulle-gil? Then why not relax and cross the lake on a canoe? Don’t forget your hats and sunglasses during the day, it’s hot! Around the Uiamho lake you can find places like KT&G Chuncheon Sangsangmadang and Dancing Caffeine where you can feel the youth and art with a cup of coffee.

Best time to visit
As with all popular tourist sites, Uiamho Mulle-gil is also most crowded on Saturdays. If you need some space, we recommend Sundays instead. Also 2pm is a good time to visit to avoid traffic, except for summer as 2pm is the hottest time of the day.

COVID-19 SPECIAL SECTION

/

Kakao T gaining more attention in the untact era

Kakao T Taxi on the move to safety

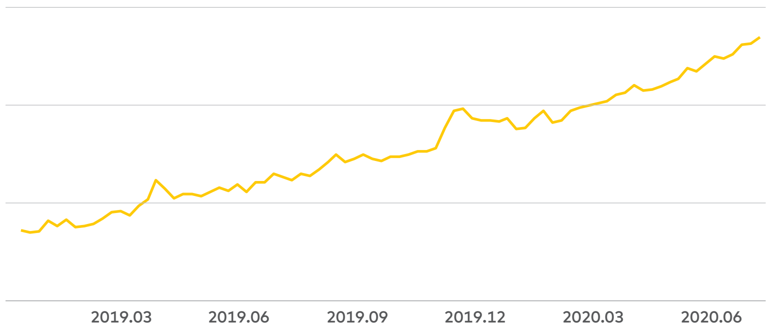
Even cities without subways have taxis. In some rural areas where it is hard to maintain bus operations, a new concept was introduced, which is "a call-based 100 won taxi". Kakao T Taxi feels the heavy responsibility that follows a service used by many people. To ensure safe mobility, Kakao T Taxi worked hard in the midst of COVID-19.

Kakao T
Automatic Payment
No contact needed

The first mobility innovation Kakao T Taxi has brought was "automatic fare payment". As you can easily infer, it is a system that automatically pays the taxi fare. Users just need to add their credit cards to the Kakao T app, and when they get off a Kakao T taxi, the fare is automatically paid. No need to search for a change or your lost wallet. You can even call a taxi for someone who is short on cash! It is so convenient.

As the service was appealing, the number of automatic payment users grew fast each year. Now the image of taxi drivers and users handing out cash or credit cards to each other is quickly fading away.

No. of taxi calls from automatic payment users

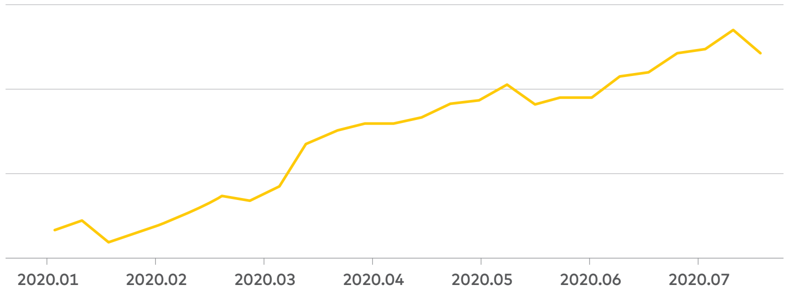


• No. of taxi calls from automatic payment users | Jan. 2019 ~ Jul. 2020, automatic payment users who called a mid-sized standard taxi

Auto payment users increase due to COVID-19

Automatic payment service especially got its spotlight in the untact era. Considering that coronavirus can live for a considerable amount of time on human skin, automatic payment was a good way to prevent the spread of the virus as it reduces the possibility of indirect contact between people. As a result, the number of taxi calls using automatic payment service has increased on a national level (compared to total taxi calls) as the virus spread throughout the country. It increased by 8 percent point compared to pre-COVID times, and the fastest increase in the same period was seen in three cities that were hit hard by the disease - Daegu, Seoul and Daejeon.

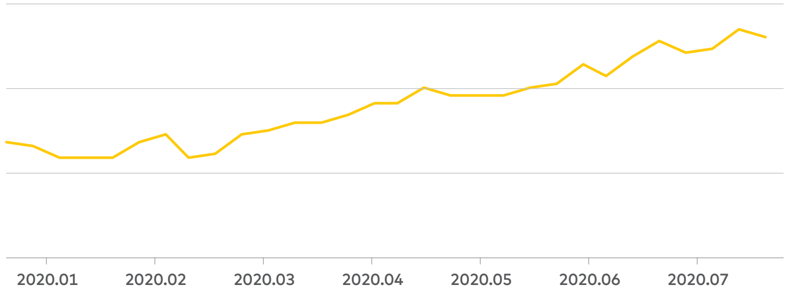
Automatic payment users ratio | Nationwide



Seoul (metropolitan area)

The number of automatic payment service users in Seoul has been steadily increasing since the emergence of COVID-19. Having the highest rate of users compared to other regions, this area showed about an 8 percentage point increase compared to pre-COVID era. Compared with other regions, the numbers spiked up since February which was the early stage of COVID-19 crisis.

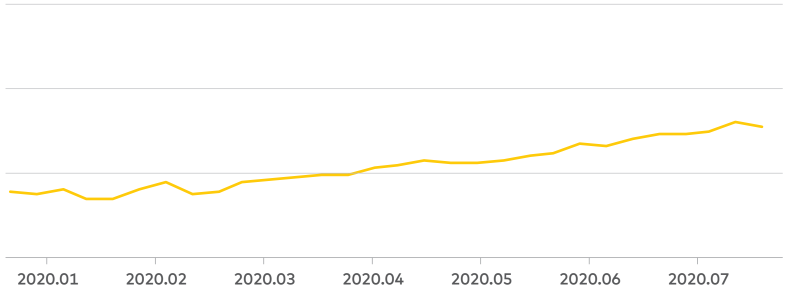
Automatic payment users ratio | Seoul (metropolitan area)



Daegu (Gyeongbuk)

Since the 31st patient occurred in Shincheonji Daegu Church, the number of patients started to explode in Daegu and Gyeongbuk region. The government heightened the crisis level to “Serious” at the end of February and the number of automatic payment users sharply increased since then and continued to March when Daegu and some areas in Gyeongbuk were declared as Special Disaster Areas. The number increased by 6 percentage points compared to the pre-COVID times.

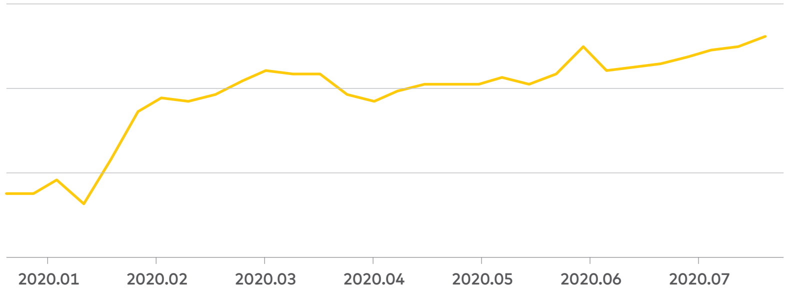
Automatic payment users ratio | Daegu (Gyeongbuk)



Daejeon (Chungnam)

Daejeon saw a significant decrease in the number of taxi call service users in March which led to a decrease in the automatic payment users as well. However, with the belated increase of patients in Chungnam in April, the number of users increased, which was about 6 percentage points at most compared to pre-COVID period. The growth stagnated for a while but started to sharply increase again when the virus attacked Daejeon in mid-June.

Automatic payment users ratio | Daejeon (Chungnam)



- Compared the automatic payment user ratio nationwide in early January (before COVID-19) and the end of July
- To exclude the cases of increased users caused by service expansion, only those who took a mid-sized standard taxi were counted into the analysis
- Untact is a newly coined word to indicate a tendency or situation where a person does not contact with others as part of social distancing to prevent the virus from spreading

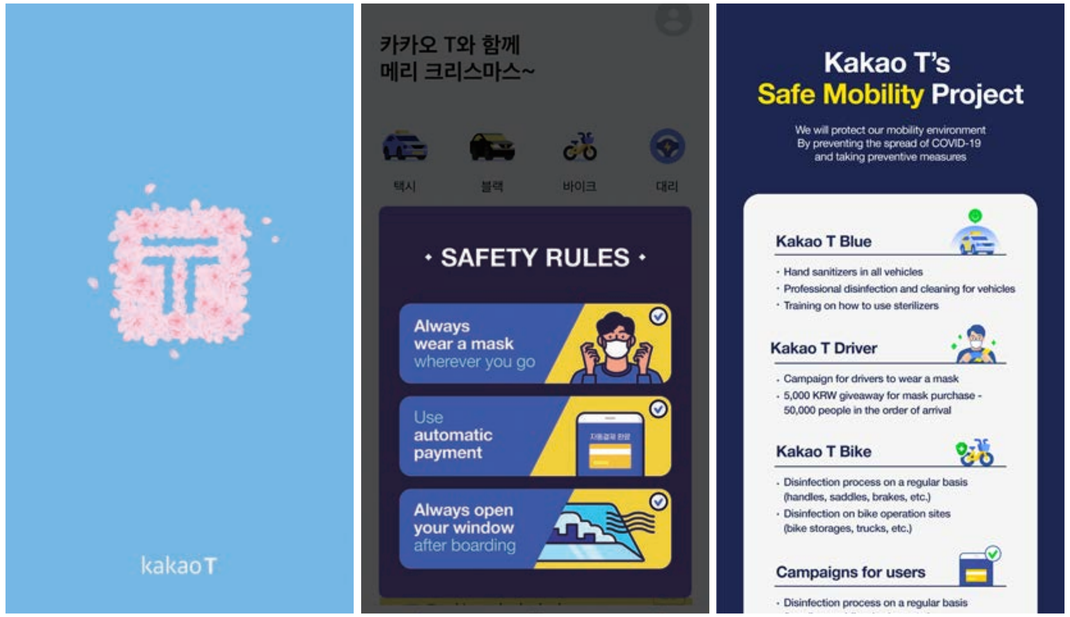
How Kakao T Taxi copes with the ever changing COVID-19

As the virus spread continuously in March, Kakao T Taxi took its stand to prevent the spreading. It sent messages to eight million KakaoTalk channel subscribers on safety rules for mobility and automatic payment systems. It also increased awareness of the virus by showing “safe mobility” banner ads on the main screen of T Taxi and screens shown during calling or riding T Taxi.

“Something small...for those of you who cannot enjoy the warm spring day outside”

Flowers bloomed in April as it should in spring days, but since the number of patients reached 10,000, the level of social distancing was raised. For those who missed the joy of spring flowers, Kakao T Taxi prepared a small gift - an “online flower viewing”. When Kakao T app users opened the app they would see cherry blossoms flying across the screen, and when they called a taxi, it would come running with flower petals flying by. This was small, but it was kind of a “nudge” to send a bigger message. After successfully getting people’s attention, Kakao T Taxi proactively and clearly sent out the message of “safety rules for mobility”. Kakao T Taxi’s efforts to prevent any further damages from the virus still continues.

Kakao T’s Safe Mobility Campaign



카카오 T와 함께
메리 크리스마스~

• SAFETY RULES •

Always wear a mask wherever you go

Use automatic payment

Always open your window after boarding

Kakao T’s
Safe Mobility Project

We will protect our mobility environment
By preventing the spread of COVID-19
and taking preventive measures

Kakao T Blue
- Hand sanitizers in all vehicles
- Professional disinfection and cleaning for vehicles
- Training on how to use sterilizers

Kakao T Driver
- Campaign for drivers to wear a mask
- 5,000 KRW giveaway for mask purchase - 50,000 people in the order of arrival

Kakao T Bike
- Disinfection process on a regular basis (handles, saddles, brakes, etc.)
- Disinfection on bike operation sites (bike storages, trucks, etc.)

Campaigns for users
- Disinfection process on a regular basis

“COVID-19 is now a part of our lives…”

In alignment with the national efforts to prevent additional spreading of COVID-19 within local communities, Kakao T Taxi has clearly delivered the message to users to keep the three principles of safe mobility, which are wearing a mask, using automatic payment, and ventilating vehicles. KakaoTalk channel messages were sent to more users than in the beginning, and messages were spread out through in-app banners and social contents. Moreover, hand sanitizers were provided to all Kakao T Blue vehicles to prevent the virus from spreading to users and drivers. For vehicles operating in Daegu area where the situation was serious, all vehicles replaced their filters to HEPA filters that filter out fine dust and viruses. Masks were provided to all drivers for Kakao T Blue, Venti, and Black and online training courses on hygiene were provided.
For everyone’s safe taxi riding, Kakao T Taxi is running, as always.

Sanitizing Kakao T Blue vehicles & driver training

Kakao T Parking Crisis became a stepping stone

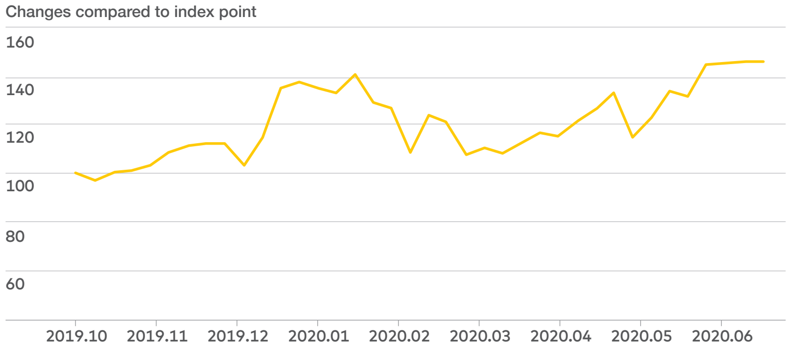
"COVID-19" has brought many changes to our mobility life. Let's find out how COVID-19 has impacted on the users' demands for parking lots and untact payment service by looking at the usage pattern of Kakao T Parking.

Usage increased after COVID-19

Since February 2020, both the number of Kakao T Parking users and its usage have increased. It is because people started avoiding public transportations due to COVID-19 and the demand for riding private cars has increased. Another reason is the increased demand for automatic payment, which enables untact payment. People who wanted to minimize contact with other people seemed to like Kakao T Parking because it helps them park safely in COVID-19 crisis.

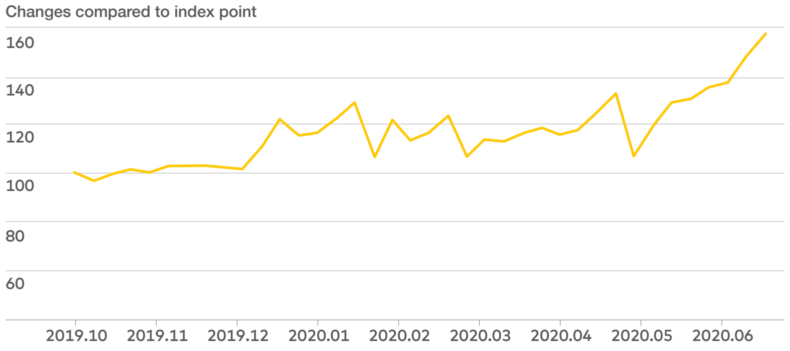
Pangyo public parking lot is located in the Pangyo business district among lots of office buildings. Most of the parking lot users are commuters to offices in Pangyo. From February when COVID-19 patients started to increase to late July, the number of users who used automatic payment in the parking lot grew by 26% compared year on year. This is because more people chose to take their own cars for commuting instead of taking public transportations, and the number of untact mobile payment users has increased for paying parking lot fees.

Changes in the no. of users who paid with automatic payment system in Kakao T Parking



The number of reservations and automatic payment usage rate in Kakao T affiliated parking lots have increased by 15% after the significant growth in the number of COVID-19 patients. This is because Kakao T app advertised its untact automatic payment system within the app and the demand for parking increased proportionally due to increased usage of private owned cars. Hopefully, Kakao T Parking will help spread the culture of safely paying parking fees by using untact mobile payment service.

Changes in the no. of users who used Kakao T Parking



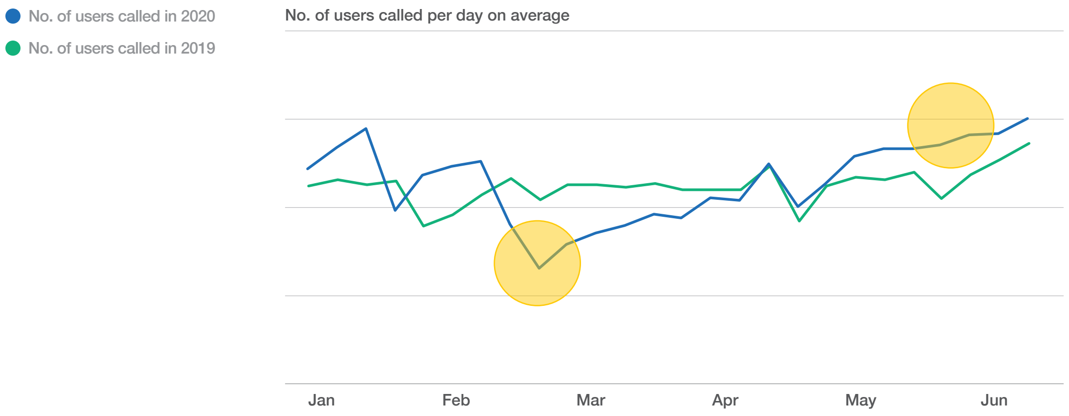
· Daily average of automatic payment usage per week, daily average of parking lot usage per week | Index is 100 (Oct. 2019), data period : Oct. 3 2019 ~ Jun. 18 2020

Kakao T Driver perfect fit for the untact era

A national outbreak of COVID-19 greatly reduced the number of calls for designated drivers, as people stopped gathering as a part of heightened social distancing. In late February when a group infection occurred in Daegu, the number of Kakao T Driver users decreased by up to 25% compared to the previous year. But with the COVID-19 crisis being prolonged and social distancing endlessly going on, people started to resume their lives in a new way. Rather than cutting out all meetings and gatherings like they did when the virus first spread throughout the nation, people started to resume their social life while keeping social distance at the same time.

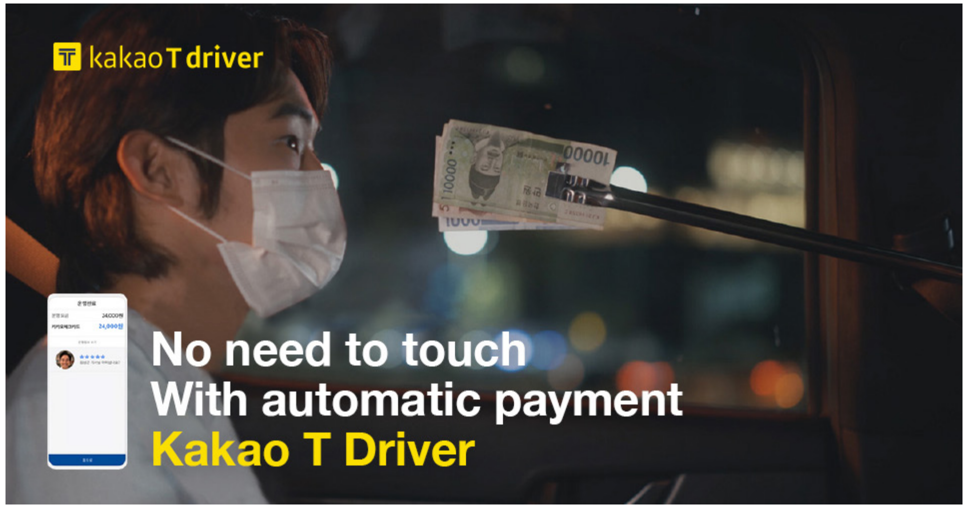
In this trend, "untact" became a new topic and the demand for services that minimizes human contact such as Kakao T Driver has significantly increased. Unlike other designated driver services, Kakao T Driver does not ask your departure or destination points and you can minimize contact in the payment stage by using automatic payment service. As a result, the number of Kakao T Driver users have increased by more than 20% compared to the previous year and it is still growing.

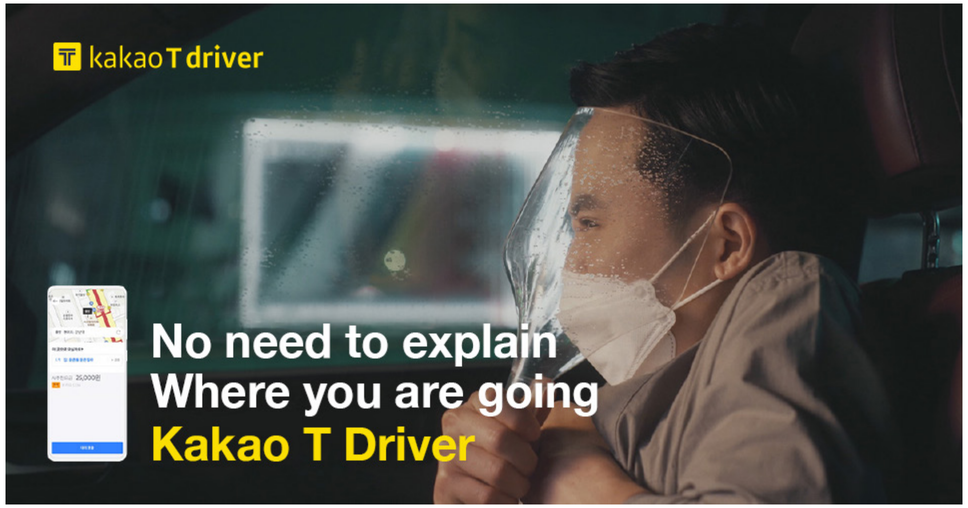
Changes in the no. of Kakao T Driver calls before & after COVID-19



• Changes in the no. of Kakao T Driver calls before & after COVID-19 | No. of Kakao T Driver users called per day on average

Driver service in the untact era
Get designated drivers at Kakao T
Please wear a mask
After boarding
Please take the back seat
For social distancing


kakao T driver
No need to touch
With automatic payment
Kakao T Driver


kakao T driver
No need to explain
Where you are going
Kakao T Driver

Kakaonavi National Hot Places

Jul. 2019 ~ Jun. 2020, Based on completed rides

National TOP 100

Rank	Place	Region	change
1	Incheon Int'l Airport Terminal 1	Jung-gu, Incheon	+0
2	Gimpo Int'l Airport Domestic Line	Gangseo-gu, Seoul	+0
3	Starfield Hanam	Hanam, Gyeonggi	+2
4	Gwangmyeong Station	Gwangmeyong, Gyeonggi	+0
5	Incheon Int'l Airport Terminal 2	Jung-gu, Incheon	-2
6	Gangnam Station Line 2	Gangnam-gu, Seoul	+1
7	Starfield Goyang	Goyang, Gyeonggi	+1
8	Seoul Station	Yongsan-gu, Seoul	+1
9	Asan Medical Center	Songpa-gu, Seoul	+3
10	Seoul Express Bus Terminal (Gyeongbu)	Seocho-gu, Seoul	+0
11	Busan Station	Dong-gu, Busan	+10
12	Hyundai Premium Outlet Gimpo	Gimpo, Gyeonggi	+8
13	Suwon Station Line 1	Suwon, Gyeonggi	-7
14	Sadang Station Line 2	Gwanak-gu, Seoul	-1
15	Samsung Medical Center	Gangnam-gu, Seoul	+9
16	Hapjeong Station Line 2	Mapo-gu, Seoul	-1
17	East Seoul Intercity Bus Terminal	Gwangjin-gu, Seoul	+1
18	Lotte Premium Outlet Giheung	Yongin, Gyeonggi	+17
19	Hyundai Department Store Pangyo	Seongnam, Gyeonggi	-2
20	Gimhae Int'l Airport	Gangseo-gu, Busan	+3
21	Jeju Int'l Airport	Jeju, Jeju	+9
22	IKEA Goyang	Goyang, Gyeonggi	-11
23	Hongik University Station Line 2	Mapo-gu, Seoul	-4
24	IKEA	Gwangmeyong, Gyeonggi	-10
25	Seoul National University Hospital Bundang	Seongnam, Gyeonggi	+0
26	Daejeon Station	Dong-gu, Daejeon	+3
27	Sillim Station Line 2	Gwanak-gu, Seoul	-1
28	Eulwangri Beach	Jung-gu, Incheon	+16
29	Jamsil Station Line 2	Songpa-gu, Seoul	-7
30	Soraepogu Fish Market	Namdong-gu, Incheon	+3
31	Yongsan Station	Yongsan-gu, Seoul	-4
32	Dongdaegu Station	Dong-gu, Daegu	-1
33	Suseo Station Line 3	Gangnam-gu, Seoul	+3
34	Seoul National University Hospital	Jongro-gu, Seoul	+9
35	Daejeon Complex Terminal	Dong-gu, Daejeon	-1
36	Siheung Premium Outlet	Siheung, Gyeonggi	new
37	Suwon City Hall	Suwon, Gyeonggi	+3
38	Pyeongtaek Station	Pyeongtaek, Gyeonggi	+13
39	Yeongdeungpo Station	Yeongdeungpo-gu, Seoul	+0
40	Sokcho Tourist & Fishery Market Parking Lot	Sokcho, Gangwon	+41
41	Shinsegae Department Store Gangnam	Seocho-gu, Seoul	+16
42	Hyundai Premium Outlet Songdo	Yeonsu-gu, Incheon	-1
43	Shinsegae Department Store Centum City	Haeundae-gu, Busan	+12
44	Osong Station	Cheongju, Chungbuk	+9
45	Gwangju Songjeong Station	Gwangsan-gu, Gwangju	+9
46	Incheon Int'l Airport	Jung-gu, Incheon	-30
47	Bupyeong Station Line 1	Bupyeong-gu, Incheon	-15
48	Daecheon Beach	Boryeong, Chungnam	+29
49	Cheonan Asan Station	Asan, Chungnam	-7
50	Dongtan Station	Hwaseong, Gyeonggi	+13
51	Konkuk University Station Line 2	Gwangjin-gu, Seoul	-14
52	Yatap Station Bundang Line	Seongnam, Gyeonggi	-14
53	Costco Gongse	Yongin, Gyeonggi	13
54	Anyang Station	Anyang, Gyeonggi	-4
55	IKEA Giheung	Yongin, Gyeonggi	new
56	Everland	Yongin, Gyeonggi	-10
57	Sangroksu Station Line 4	Ansan, Gyeonggi	-12
58	Ulsan Station	Ulju, Ulsan	18
59	Yeoju Premium Outlet	Yeoju, Gyeonggi	new
60	Seoul Nambu Terminal	Seocho-gu, Seoul	-13
61	Lotte Premium Outlet Icheon	Icheon, Gyeonggi	6
62	Ajou University Hospital	Suwon, Gyeonggi	9
63	Incheon Bus Terminal Complex	Michuhol, Incheon	-3
64	Lotte Premium Outlet Paju	Paju, Gyeonggi	9
65	Moran Station Line 8	Seongnam, Gyeonggi	-3
66	Uijeongbu Station Line 1	Uijeongbu, Gyeonggi	-1
67	Cheongju Bus Terminal	Cheongju, Chungbuk	5
68	Suwon Station	Suwon, Gyeonggi	new
69	Costco Hanam	Hanam, Gyeonggi	new
70	Paju Premium Outlet	Paju, Gyeonggi	new
71	Gangseo-gu Office	Gangseo-gu, Seoul	-2
72	Cheonho Station Line 5	Songpa-gu, Seoul	-14
73	Seohyun Station Bundang Line	Seongnam, Gyeonggi	-24
74	U-square Gwangju Bus Terminal	Seo-gu, Gwangju	-18
75	Miguem Station Bundang Line	Seongnam, Gyeonggi	0
76	Indeokwon Station Line 4	Anyang, Gyeonggi	-15
77	Cheonan Express Bus Terminal	Cheonan, Chungnam	5
78	Urijip	Hwaseong, Gyeonggi	30
79	Lotte Premium Outlet Dongbusan	Gijang, Busan	38
80	COEX	Gangnam-gu, Seoul	-32
81	Jeongja Station Bundang	Seongnam, Gyeonggi	-13
82	Gwanganri Beach	Suyeong-gu, Busan	10
83	Haeundae Beach	Haeundae-gu, Busan	57
84	Bucheon Station Line 1	Bucheon, Gyeonggi	-14
85	Costco Yangjae	Seocho-gu, Seoul	3
86	Suwon Bus Terminal	Suwon, Gyeonggi	-3
87	Lotte Department Store Busan Main Branch	Busanjin-gu, Busan	28
88	Costco Ilsan	Goyang, Gyeonggi	11
89	Pangyo Sinbundang Line	Seongnam, Gyeonggi	-9
90	Costco Gwangmyeong	Gwangmeyong, Gyeonggi	1
91	Jeonju Hanok Village	Jeonju, Jeonbuk	new
92	Seolleung Station Line 2	Gangnam-gu, Seoul	-8
93	Wolmido	Jung-gu, Incheon	62
94	Sinsa Station Line 3	Gangnam-gu, Seoul	-15
95	Yeoksam Station Line 2	Gangnam-gu, Seoul	-8
96	Time Square	Yeongdeungpo-gu, Seoul	38
97	Suji-gu Office	Yongin, Gyeonggi	9
98	Yangjae Station Line 3	Seocho-gu, Seoul	-70
99	Hanam City Hall	Hanam, Gyeonggi	14
100	Hwaseong City Hall	Hwaseong, Gyeonggi	14

Seoul TOP 100

Rank	Place	Region	change
1	Gimpo Int'l Airport Domestic Line	Gangseo-gu, Seoul	0
2	Gangnam Station Line 2	Gangnam-gu, Seoul	0
3	Seoul Station	Yongsan-gu, Seoul	0
4	Asan Medical Center	Songpa-gu, Seoul	1
5	Seoul Express Bus Terminal (Gyeongbu)	Seocho-gu, Seoul	-1
6	Sadang Station Line 2	Gwanak-gu, Seoul	0
7	Samsung Medical Center	Gangnam-gu, Seoul	4
8	Hapjeong Station Line 2	Mapo-gu, Seoul	-1
9	East Seoul Intercity Bus Terminal	Gwangjin-gu, Seoul	-1
10	Hongik University Station Line 2	Mapo-gu, Seoul	-1
11	Sillim Station Line 2	Gwanak-gu, Seoul	1
12	Jamsil Station Line 2	Songpa-gu, Seoul	-2
13	Yongsan Station	Yongsan-gu, Seoul	0
14	Suseo Station Line 3	Gangnam-gu, Seoul	1
15	Seoul National University Hospital	Jongro-gu, Seoul	3
16	Yeongdeungpo Station	Yeongdeungpo-gu, Seoul	1
17	Shinsegae Department Store Gangnam	Seocho-gu, Seoul	5
18	Konkuk University Station Line 2	Gwangjin-gu, Seoul	-2
19	Seoul Nambu Terminal	Seocho-gu, Seoul	0
20	Gangseo-gu Office	Gangseo-gu, Seoul	5
21	Cheonho Station Line 5	Songpa-gu, Seoul	2
22	COEX	Gangnam-gu, Seoul	-2
23	Costco Yangjae	Seocho-gu, Seoul	9
24	Seolleung Station Line 2	Gangnam-gu, Seoul	5
25	Sinsa Station Line 3	Gangnam-gu, Seoul	3
26	Yeoksam Station Line 2	Gangnam-gu, Seoul	5
27	Time Square	Yeongdeungpo-gu, Seoul	22
28	Yangjae Station Line 3	Seocho-gu, Seoul	-14
29	Lotte Department Store Main Branch	Jung-gu, Seoul	4
30	Yeonsinnae Station Line 3	Eunpyeong-gu, Seoul	7
31	Seoul National University Station Line2	Gwanak-gu, Seoul	4
32	Itaewon Station Line 6	Yongsan-gu, Seoul	-6
33	Gimpo Int'l Airport International	Gangseo-gu, Seoul	-6
34	Hwagok Station Line 5	Gangseo-gu, Seoul	4
35	Dangsan Station Line 2	Yeongdeungpo-gu, Seoul	-1
36	Shinsegae Department Store Main Branch	Jung-gu, Seoul	12
37	Gangnam Severance Hospital	Gangnam-gu, Seoul	10
38	Hyundai Department Store Apgujeong Main Branch	Gangnam-gu, Seoul	4
39	Hyundai Department Store Mokdong	Yangcheon-gu, Seoul	-3
40	Nowon Station Line 4	Nowon-gu, Seoul	-1
41	The Catholic University St. Mary's Hospital	Seocho-gu, Seoul	new
42	Korea University Hospital Guro	Guro-gu, Seoul	13
43	Balsan Station Line 5	Gangseo-gu, Seoul	-2
44	Gimpo Int'l Airport Domestic Line Parking Lot 1	Gangseo-gu, Seoul	new
45	Lotte World Tower & Lotte World Mall Parking Lot	Songpa-gu, Seoul	-15
46	Suyu Station Line 4	Gangbuk-gu, Seoul	-2
47	Guro Digital Complex Station Line 2	Guro-gu, Seoul	-1
48	Isu Station Line 7	Dongjak-gu, Seoul	-5
49	Garak Market	Songpa-gu, Seoul	15
50	Gunja Station Line 5	Gwangjin-gu, Seoul	0

Gangwon TOP 25

Rank	Place	Region	change
1	Sokcho Tourist & Fishery Market Parking Lot	Sokcho, Gangwon	1
2	Sokcho Beach	Sokcho, Gangwon	new
3	Wonju Intercity Bus Terminal	Wonju, Gangwon	1
4	Gangwon Land	Jeongseon-gun, Gangwon	-3
5	Anmok Beach	Gangneung, Gangwon	2
6	Gangneung Jungang Market	Gangneung, Gangwon	10
7	Gyeongpodae	Gangneung, Gangwon	-2
8	Jumunjin Fish Market	Gangneung, Gangwon	6
9	Gyeongpo Beach	Gangneung, Gangwon	6
10	Jumunjin Port	Gangneung, Gangwon	1
11	Gangneung City Hall	Gangneung, Gangwon	1
12	Sokcho Tourist & Fishery Market	Sokcho, Gangwon	5
13	Wonju City Hall	Wonju, Gangwon	0
14	Daepo Port	Sokcho, Gangwon	-4
15	Jeongdongjin Beach	Gangneung, Gangwon	3
16	Sono Belle Vivaldi Park	Hongcheon-gun, Gangwon	new
17	St. John's Hotel Gyeongpo	Gangneung, Gangwon	31
18	Donghwa Garden	Gangneung, Gangwon	16
19	Sol Beach Samcheok	Samcheok, Gangwon	new
20	Gangneung Station	Gangneung, Gangwon	3
21	Emart Sokcho	Sokcho, Gangwon	1
22	Chuncheon City Hall	Chuncheon, Gangwon	5
23	Seorak Cable Car	Sokcho, Gangwon	-3
24	Yongpyeong Resort	Pyeongchang-gun, Gangwon	11
25	Gangneung Cafe Street	Gangneung, Gangwon	-4

Gyeonggi TOP 25

Rank	Place	Region	change
1	Starfield Hanam	Hanam, Gyeonggi	1
2	Gwangmyeong Station	Gwangmeyong, Gyeonggi	-1
3	Starfield Goyang	Goyang, Gyeonggi	1
4	Hyundai Premium Outlet Gimpo	Gimpo, Gyeonggi	4
5	Suwon Station Line 1	Suwon, Gyeonggi	-2
6	Lotte Premium Outlet Giheung	Yongin, Gyeonggi	4
7	Hyundai Department Store Pangyo	Seongnam, Gyeonggi	0
8	IKEA Goyang	Goyang, Gyeonggi	-3
9	IKEA Gwangmyeong	Gwangmeyong, Gyeonggi	-3
10	Seoul National University Hospital Bundang	Seongnam, Gyeonggi	-1
11	Siheung Premium Outlet	Siheung, Gyeonggi	new
12	Suwon City Hall	Suwon, Gyeonggi	0
13	Pyeongtaek Station	Pyeongtaek, Gyeonggi	4
14	Dongtan Station	Hwaseong, Gyeonggi	6
15	Yatap Station Bundang Line	Seongnam, Gyeonggi	-4
16	Costco Gongse	Yongin, Gyeonggi	6
17	Anyang Station	Anyang, Gyeonggi	-1
18	IKEA Giheung	Yongin, Gyeonggi	new
19	Everland	Yongin, Gyeonggi	-5
20	Sangroksu Station Line 4	Ansan, Gyeonggi	-7
21	Yeoju Premium Outlet	Yeoju, Gyeonggi	new
22	Lotte Premium Outlet Icheon	Icheon, Gyeonggi	1
23	Ajou University Hospital	Suwon, Gyeonggi	3
24	Lotte Premium Outlet Paju	Paju, Gyeonggi	3
25	Moran Station Line 8	Seongnam, Gyeonggi	-6

Gyeongnam TOP 25

Rank	Place	Region	change
1	Lotte Premium Outlet Gimhae	Gimhae, Gyeongnam	0
2	Pusan National University Yangsan Hospital	Yangsan, Gyeongnam	0
3	Gimhae City Hall	Gimhae, Gyeongnam	0
4	Changwon City Hall	Changwon, Gyeongnam	1
5	Lotte Mart Jangyu	Gimhae, Gyeongnam	1
6	Tongyeong Traditional Central Market	Tongyeong, Gyeongnam	1
7	Masan Intercity Bus Terminal	Changwon, Gyeongnam	1
8	Jinju City Hall	Jinju, Gyeongnam	1
9	Tongdosa	Yangsan, Gyeongnam	3
10	Masan Station	Changwon, Gyeongnam	6
11	Hill of Wind	Geoje, Gyeongnam	2
12	Emart Yangsan	Yangsan, Gyeongnam	-1
13	Geoje City Hall	Geoje, Gyeongnam	2
14	Hanwha Resort Geojae Belvedere	Geoje, Gyeongnam	7
15	German Village	Namhae-gun, Gyeongnam	7
16	Milyang City Hall	Milyang, Gyeongnam	2
17	Lotte Department Store Changwon	Changwon, Gyeongnam	8
18	Tongyeong City Hall	Tongyeong, Gyeongnam	-1
19	Changwon Station	Changwon, Gyeongnam	4
20	Yangsan City Hall	Yangsan, Gyeongnam	4
21	Tongyeong Cable Car	Tongyeong, Gyeongnam	-17
22	Gimhae Centum Doosan Weve the Zenith Apt	Gimhae, Gyeongnam	78
23	Jinju Bus Terminal	Jinju, Gyeongnam	-9
24	Milyang Station	Milyang, Gyeongnam	7
25	Inje University Gimhae Campus	Gimhae, Gyeongnam	1

Gyeongbuk TOP 25

Rank	Place	Region	change
1	Yeongildae Beach	Pohang, Gyeongbuk	2
2	Jukdo Market	Pohang, Gyeongbuk	-1
3	Gumi Station	Gumi, Gyeongbuk	-1
4	Hwangridangil	Gyeongju, Gyeongbuk	3
5	Pohang City Hall	Pohang, Gyeongbuk	0
6	Cheomseongdae	Gyeongju, Gyeongbuk	-2
7	Homigot	Pohang, Gyeongbuk	9
8	Singyeongju Station	Gyeongju, Gyeongbuk	1
9	Gyeongju Bus Terminal	Gyeongju, Gyeongbuk	-1
10	Ganggu Port	Yeongdeokgun, Gyeongbuk	3
11	Pohang Station	Pohang, Gyeongbuk	3
12	Gyeongju Bomun Tourist Complex	Gyeongju, Gyeongbuk	-1
13	Donggung Palace and Wolji Pond	Gyeongju, Gyeongbuk	-3
14	Gyeongju City Hall	Gyeongju, Gyeongbuk	1
15	Yeongnam University Gyeongsan Campus	Gyeongsan, Gyeongbuk	-3
16	Gumi City Hall	Gumi, Gyeongbuk	1
17	Gyeongju Station	Gyeongju, Gyeongbuk	2
18	Yeongcheon City Hall	Yeongcheon, Gyeongbuk	5
19	Mungyeong City Hall	Mungyeong, Gyeongbuk	3
20	Pohang Terminal	Pohang, Gyeongbuk	1
21	Gimcheon Station	Gimcheon, Gyeongbuk	-1
22	Andong City Hall	Andong, Gyeongbuk	3
23	Gimcheon (Gumi) Station	Gimcheon, Gyeongbuk	4
24	Bulguksa	Gyeongju, Gyeongbuk	-18
25	Gyeongsangbukdo Provincial Office	Andong, Gyeongbuk	1

Gwangju TOP 25

Rank	Place	Region	change
1	Gwangju Songjeong Station	Gwangsan-gu, Gwangju	0
2	U-square Gwangju Bus Terminal	Seo-gu, Gwangju	0
3	Gwangju Metropolitan City Hall	Seo-gu, Gwangju	0
4	Shinsegae Department Store	Seo-gu, Gwangju	1
5	Chonnam National University Hospital	Dong-gu, Gwangju	-1
6	De Mer Wedding Hall	Gwangsan-gu, Gwangju	3
7	Lotte Department Store Gwangju	Dong-gu, Gwangju	-1
8	Gwangju Airport	Gwangsan-gu, Gwangju	0
9	Lotte Outlet Gwangju Suwan	Gwangsan-gu, Gwangju	-2
10	NC Wave Chungjang	Dong-gu, Gwangju	0
11	Gwangju Station	Buk-gu, Gwangju	0
12	U-square Gwangju Complex Bus Terminal	Seo-gu, Gwangju	new
13	Gwangju University	Nam-gu, Gwangju	-1
14	Suwan Police Division	Gwangsan-gu, Gwangju	2
15	Chosun University	Dong-gu, Gwangju	66
16	Lotte Mart Cheomdan	Gwangsan-gu, Gwangju	-1
17	Cheomdan Hospital	Gwangsan-gu, Gwangju	-3
18	Emart Bongseon	Nam-gu, Gwangju	2
19	Kimdaejung Convention Center	Seo-gu, Gwangju	-6
20	Cheonji Funeral Hall	Seo-gu, Gwangju	7
21	Homeplus Donggwangju	Buk-gu, Gwangju	-2
22	Chosun University Hospital	Dong-gu, Gwangju	1
23	Gwangju Women's University	Gwangsan-gu, Gwangju	-1
24	Honam University	Gwangsan-gu, Gwangju	-6
25	Wedding Group Withus Gwangju	Seo-gu, Gwangju	7

Daegu TOP 25

Rank	Place	Region	change
1	Dongdaegu Station	Dong-gu, Daegu	1
2	Shinsegae Department Store Daegu	Dong-gu, Daegu	-1
3	Daegu Int'l Airport	Dong-gu, Daegu	1
4	Suseongmot	Suseong-gu, Daegu	4
5	Hyundai Department Store Daegu	Jung-gu, Daegu	-2
6	Daegu Station	Jung-gu, Daegu	4
7	Kyungpook National University Hospital Chilgok	Buk-gu, Daegu	0
8	Costco Daegu	Buk-gu, Daegu	-3
9	Yeongnam University Hospital	Nam-gu, Daegu	-3
10	Seomun Market	Jung-gu, Daegu	-1
11	Keimyung University Dongsan Hospital	Dalseo-gu, Daegu	new
12	Daegu Seobu Station	Nam-gu, Daegu	0
13	Costco Daegu Innovation City	Dong-gu, Daegu	4
14	Daegu Metropolitan City Hall	Jung-gu, Daegu	6
15	Bukdaegu IC	Buk-gu, Daegu	-4
16	Kyungpook National University Hospital	Jung-gu, Daegu	6
17	Lotte Outlet Esiapolis	Dong-gu, Daegu	-1
18	Homeplus Seongseo	Dalseo-gu, Daegu	new
19	Emart Traders Bisan	Seo-gu, Daegu	-5
20	Suseong IC	Suseong-gu, Daegu	-7
21	Dongdaegu Station Parking Lot 2	Dong-gu, Daegu	new
22	Emart Wolbae	Dalseo-gu, Daegu	1
23	Dongdaegu Terminal	Dong-gu, Daegu	3
24	EXCO	Buk-gu, Daegu	3
25	Daegu Fatima Hospital	Dong-gu, Daegu	-6

Daejeon TOP 25

Rank	Place	Region	change
1	Daejeon Station	Dong-gu, Daejeon	0
2	Daejeon Complex Terminal	Dong-gu, Daejeon	0
3	Galleria Timeworld	Seo-gu, Daejeon	0
4	Daejeon National Cemetery	Yuseong-gu, Daejeon	0
5	Lotte Department Store Daejeon	Seo-gu, Daejeon	0
6	Daejon Metropolitan City Hall	Seo-gu, Daejeon	0
7	Chungnam National University Hospital	Jung-gu, Daejeon	1
8	Emart Traders Wolpyeong	Seo-gu, Daejeon	7
9	Seodaejeon Station	Jung-gu, Daejeon	1
10	Konyang University Hospital	Seo-gu, Daejeon	-1
11	Sintanjin Station	Daedeok-gu, Daejeon	1
12	Yuseong IC	Yuseong-gu, Daejeon	-5
13	Costco Daejeon	Jung-gu, Daejeon	-2
14	Daejeon IC	Daedeok-gu, Daejeon	3
15	Mokwon University	Seo-gu, Daejeon	-1
16	Homeplus Yuseong	Yuseong-gu, Daejeon	0
17	Sung Sim Dang Main Branch	Jung-gu, Daejeon	-4
18	Emart Dunsan	Seo-gu, Daejeon	1
19	Banseok Station Daejeon Line 1	Yuseong-gu, Daejeon	-1
20	Moda Outlet Daejeon	Yuseong-gu, Daejeon	4
21	La Domus Art Center	Yuseong-gu, Daejeon	-1
22	Sintanjin IC	Daedeok-gu, Daejeon	3
23	Daejeon Station East Square	Dong-gu, Daejeon	-1
24	Sei Department Store	Jung-gu, Daejeon	2
25	Daejeon District Court	Seo-gu, Daejeon	10

Busan TOP 25

Rank	Place	Region	change
1	Busan Station	Dong-gu, Busan	0
2	Gimhae Int'l Airport	Gangseo-gu, Busan	0
3	Shinsegae Department Store Centum City	Haeundae-gu, Busan	0
4	Lotte Premium Outlet Dongbusan	Gijang, Busan	2
5	Gwanganri Beach	Suyeong-gu, Busan	-1
6	Haeundae Beach	Haeundae-gu, Busan	2
7	Lotte Department Store Busan Main Branch	Busanjin-gu, Busan	-2
8	Busan Seobu Bus Terminal	Sasang-gu, Busan	-1
9	IKEA Dongbusan	Gijang, Busan	new
10	Songjeong Beach	Haeundae-gu, Busan	0
11	Busan Central Bus Terminal	Geumjeong-gu, Busan	-2
12	Busan Premium Outlet	Gijang, Busan	89
13	Busan Metropolitan City Hall	Yeonje-gu, Busan	-2
14	Costco Busan	Suyeong-gu, Busan	-2
15	Busan Station Port Parking Lot	Dong-gu, Busan	2
16	Dadaepo Beach	Saha-gu, Busan	4
17	Pusan University Busan Campus	Geumjeong-gu, Busan	-4
18	Gimhae Int'l Airport Domestic Line	Gangseo-gu, Busan	8
19	Lotte Department Store Gwangbok	Jung-gu, Busan	-1
20	Haedong Yonggungsa	Gijang, Busan	-4
21	Waveon Coffee	Gijang, Busan	-2
22	Inje University Haeundae Paik Hospital	Haeundae-gu, Busan	2
23	Songdo Beach	Seo-gu, Busan	2
24	Pusan National University Hospital	Seo-gu, Busan	6
25	Hilton Busan	Gijang, Busan	95

Sejong TOP 25

Rank	Place	Region	change
1	Costco Sejong	Sejong	0
2	Jochiwon Station	Sejong	0
3	Emart Sejong	Sejong	0
4	Sejong City Hall	Sejong	0
5	Homeplus Sejong	Sejong	1
6	Sejong Lake Park	Sejong	1
7	Sejong Express Bus Terminal	Sejong	-2
8	Urijip	Sejong	1
9	Eunhasu Funeral Hall	Sejong	1
10	Bugang Station	Sejong	1
11	CGV Sejong	Sejong	-3
12	Gajae Maeul 5 Danji Sejong Amco Town Apt	Sejong	0
13	Gobok Reservoir	Sejong	12
14	Saesaem Maeul 3 Danji Sejong Moa Miraedo River City	Sejong	48
15	Surubae Maeul 1 Danji Apt	Sejong	new
16	Gaon Maeul 3 Danji Apt	Sejong	new
17	Gajae Maeul 4 Danji Sejong Centreville	Sejong	59
18	Gajae Maeul 9 Danji Apt	Sejong	-2
19	Sanjang Garden	Sejong	33
20	Cheot Maeul 7 Danji Raemian Apt	Sejong	-3
21	Starbucks Sejong Dajeong DT	Sejong	new
22	Surubae Maeul 4 Danji Apt	Sejong	new
23	Government Complex	Sejong	-10
24	Korea University Sejong Campus	Sejong	-9
25	National Library of Sejong City	Sejong	-11

Incheon TOP 25

Rank	Place	Region	change
1	Incheon Int'l Airport Terminal 1	Jung-gu, Incheon	0
2	Incheon Int'l Airport Terminal 2	Jung-gu, Incheon	0
3	EulwangriBeach	Jung-gu, Incheon	4
4	Soraepogu Fish Market	Namdong-gu, Incheon	1
5	Hyundai Premium Outlet Songdo	Yeonsu-gu, Incheon	1
6	Incheon Int'l Airport	Jung-gu, Incheon	-3
7	Bupyeong Station Line 1	Bupyeong-gu, Incheon	-3
8	Incheon Bus Terminal Complex	Michuhol, Incheon	0
9	Wolmido	Jung-gu, Incheon	3
10	Juan Station Line 1	Michuhol, Incheon	0
11	Gyeyang-gu Office	Gyeyang-gu, Incheon	0
12	Geomdan Sageori	Seo-gu, Incheon	1
13	Incheon Metropolitan City Seo-gu Office	Seo-gu, Incheon	5
14	Emart Traders Songrim	Dong-gu, Incheon	3
15	Lotte Department Store Incheon Terminal	Michuhol, Incheon	61
16	Costco Songdo	Yeonsu-gu, Incheon	-2
17	Dongmak Beach	Ganghwa-gun, Incheon	6
18	Incheon Metropolitan City Hall	Namdong-gu, Incheon	-2
19	Inha University Hospital	Jung-gu, Incheon	1
20	Incheon Int'l Airport Short-tem Parking Lot	Jung-gu, Incheon	new
21	Bupyeong-gu Office	Bupyeong-gu, Incheon	1
22	Gyesan Station Incheon Line 1	Gyeyang-gu, Incheon	-3
23	Incheon Int'l Airport T1P1 Long-term Parking Lot	Jung-gu, Incheon	-2
24	The Catholic University St. Mary's Hospital Incheon	Bupyeong-gu, Incheon	2
25	Incheon Fish Market	Jung-gu, Incheon	14

Ulsan TOP 25

Rank	Place	Region	change
1	Ulsan Station	Ulju, Ulsan	0
2	Ulsan Metropolitan City Hall	Nam-gu, Ulsan	0
3	Ganjeolgot	Ulju, Ulsan	1
4	Ulsan University	Nam-gu, Ulsan	-1
5	Hyundai Department Store Ulsan	Nam-gu, Ulsan	1
6	Lotte Department Store Ulsan	Nam-gu, Ulsan	-1
7	Ulsan Bus Terminal	Nam-gu, Ulsan	0
8	Ulsan University Hospital	Dong-gu, Ulsan	0
9	Costco Ulsan	Buk-gu, Ulsan	0
10	Ilsan Beach	Dong-gu, Ulsan	0
11	Jinha Beach	Ulju, Ulsan	2
12	Emart Ulsan	Nam-gu, Ulsan	0
13	Ulsan Airport	Buk-gu, Ulsan	-2
14	Taehwagang National Garden Simridae Forest	Jung-gu, Ulsan	new
15	Sinbok Rotary	Nam-gu, Ulsan	0
16	Taehwagang Station	Nam-gu, Ulsan	1
17	Unyang Giwajip Bulgogi	Ulju, Ulsan	-3
18	Ulsan District Court	Nam-gu, Ulsan	5
19	Homplus Ulsan	Jung-gu, Ulsan	0
20	The Golf Club	Ulju, Ulsan	new
21	Ulsan Metropolitan Dong-gu Office	Dong-gu, Ulsan	0
22	Gonguptop	Nam-gu, Ulsan	0
23	Nam-gu Office	Nam-gu, Ulsan	15
24	Donggang Hospital	Jung-gu, Ulsan	2
25	Unyang-eup Community Service Center	Ulju, Ulsan	4

Jeonnam TOP 25

Rank	Place	Region	change
1	Yeosu City Hall	Yeosu, Jeonnam	0
2	Mokpo Station	Mokpo, Jeonnam	1
3	Yeosu Nangman Pocha Street	Yeosu, Jeonnam	-1
4	Cheonsa Bridge	Sinan-gun, Jeonnam	7
5	Juknokwon	Damyang-gun, Jeonnam	0
6	Suncheon Station	Suncheon, Jeonnam	2
7	Mokpo Bus Terminal	Mokpo, Jeonnam	-1
8	Suncheonman Bay National Garden	Suncheon, Jeonnam	1
9	Sol Beach Jindo	Jindo-gun, Jeonnam	new
10	Chonnam National University Hwasun Hospital	Hwasun-gun, Jeonnam	0
11	Yeosu Expo Station	Yeosu, Jeonnam	-7
12	Yeosu Maritime Cable Car	Yeosu, Jeonnam	-5
13	Wando Ferry Terminal	Wando-gun, Jeonnam	0
14	Gwangyang City Hall	Gwangyang, Jeonnam	1
15	Yeonggwang Baeksu Coastal Road	Yeonggwang-gun, Jeonnam	6
16	Odongdo Parking Lot	Yeosu, Jeonnam	1
17	Mokpo Maritime Cable Car North Port	Mokpo, Jeonnam	new
18	Jeollanamdo Provincial Office	Muan-gun, Jeonnam	0
19	Meta Province	Damyang-gun, Jeonnam	1
20	Suncheonman Bay Parking Lot	Suncheon, Jeonnam	-8
21	Hyangiram	Yeosu, Jeonnam	-7
22	Suncheon Bus Terminal	Suncheon, Jeonnam	-6
23	Suncheon City Hall	Suncheon, Jeonnam	-4
24	Pyeonghwa Square	Mokpo, Jeonnam	4
25	Hwasun-gun Office	Hwasun-gun, Jeonnam	1

Jeonbuk TOP 25

Rank	Place	Region	change
1	Jeonju Hanok Village	Jeonju, Jeonbuk	3
2	Iksan Station	Iksan-si, Jeonbuk	0
3	Jeonju Station	Jeonju, Jeonbuk	0
4	Lee Sung Dang Main Branch	Gunsan, Jeonbuk	11
5	Gunsan City Hall	Gunsan, Jeonbuk	1
6	Jeollabukdo Provincial Office	Jeonju, Jeonbuk	1
7	Seonyudo	Gunsan, Jeonbuk	1
8	Jeonju Bus Terminal	Jeonju, Jeonbuk	-3
9	Jeonju Express Bus Terminal	Jeonju, Jeonbuk	1
10	Hanok Maeul Parking Lot 1	Jeonju, Jeonbuk	new
11	Gunsan Bus Terminal	Gunsan, Jeonbuk	0
12	Jeonbuk National University Hospital	Jeonju, Jeonbuk	2
13	Gunsan University	Gunsan, Jeonbuk	0
14	Jeongeup Station	Jeongeup, Jeonbuk	5
15	Namwon City Hall	Namwon, Jeonbuk	3
16	Jeonbuk University Jeonju Campus	Jeonju, Jeonbuk	1
17	Lotte Mart Gunsan	Gunsan, Jeonbuk	-1
18	Lotte Department Store Jeonju	Jeonju, Jeonbuk	3
19	Seonyudo Beach	Gunsan, Jeonbuk	14
20	Jeonju University	Jeonju, Jeonbuk	2
21	Emart Gunsan	Gunsan, Jeonbuk	3
22	Chaeseokgang	Buan-gun, Jeonbuk	9
23	Wongang University Medical Center	Iksan-si, Jeonbuk	5
24	Muju Deokyusan Resort	Muju-gun, Jeonbuk	-12
25	Jeonju City Hall	Jeonju, Jeonbuk	-2

Chungnam TOP 25

Rank	Place	Region	change
1	Daecheon Beach	Boryeong, Chungnam	1
2	Cheonan Asan Station	Asan, Chungnam	-1
3	Cheonan Express Bus Terminal	Cheonan, Chungnam	0
4	Yedangho Chulleong Bridge	Yesan-gun, Chungnam	4
5	Ggotji Beach	Taean-gun, Chungnam	0
6	Cheonan Station Line 1	Cheonan, Chungnam	-2
7	Costco Cheonan	Cheonan, Chungnam	-1
8	Cheonan City Hall	Cheonan, Chungnam	1
9	Dangjin Bus Terminal	Dangjin-si, Chungnam	-2
10	Korea Army Training Center	Nonsan, Chungnam	6
11	Shinsaegae Department Store Chungcheong	Cheonan, Chungnam	-1
12	Samgilpo Port	Seosan, Chungnam	3
13	Dangjin City Hall	Dangjin-si, Chungnam	-1
14	Seosan Bus Terminal	Seosan, Chungnam	-3
15	Dankook University Hospital	Cheonan, Chungnam	4
16	Gongju Complex Bus Terminal	Gongju, Chungnam	1
17	Lotte Outlet Buyeo	Buyeo-gun, Chungnam	6
18	Mallipo Beach	Taean-gun, Chungnam	10
19	The Independence Hall Of Korea	Cheonan, Chungnam	-6
20	Haengdamdo Rest Area	Dangjin-si, Chungnam	5
21	Soonchunhyang University Cheonan Hospital	Cheonan, Chungnam	new
22	Onyang Oncheon Station	Asan, Chungnam	-8
23	Nonsan City Hall	Nonsan, Chungnam	3
24	Asan City Hall	Asan, Chungnam	0
25	Seosan City Hall	Seosan, Chungnam	2

Jeju TOP 25

Rank	Place	Region	change
1	Jeju Int'l Airport	Jeju, Jeju	0
2	Dongmun Traditional Market	Jeju, Jeju	1
3	Seongsan Ilchulbong	Seogwipo-si, Jeju	1
4	Seogwipo Maeil Olle Market	Seogwipo-si, Jeju	-2
5	Dongmun Traditional Market Public Parking Lot	Jeju, Jeju	0
6	Hamdeok Beach	Jeju, Jeju	1
7	Hyeopjae Beach	Jeju, Jeju	-1
8	Jeju City Hall	Jeju, Jeju	2
9	Emart Seogwipo	Seogwipo-si, Jeju	2
10	Osulloc Tea Museum	Seogwipo-si, Jeju	-2
11	Emart Sinjeju	Jeju, Jeju	2
12	Saebyul Oreum	Jeju, Jeju	2
13	Iho Tewoo Beach	Jeju, Jeju	3
14	Woljeongri Beach	Jeju, Jeju	-5
15	Ujin Haejanggook	Jeju, Jeju	5
16	Maeil Olle Market Public Parking Lot	Seogwipo-si, Jeju	new
17	Oneunjeong Gimbap	Seogwipo-si, Jeju	14
18	Ecoland Theme Park	Jeju, Jeju	-6
19	Yongduam	Jeju, Jeju	-2
20	Aewol Coastal Road	Jeju, Jeju	2
21	Hanwha Aqua Planet Jeju	Seogwipo-si, Jeju	4
22	Emart Jeju	Jeju, Jeju	12
23	Seopjicoji Parking Lot	Seogwipo-si, Jeju	-8
24	Cheonjiyeon Waterfall Parking Lot	Seogwipo-si, Jeju	new
25	Daepo Jusangjeolli	Seogwipo-si, Jeju	-7

Chungbuk TOP 25

Rank	Place	Region	change
1	Osong Station	Cheongju, Chungbuk	0
2	Cheongju Intercity Bus Terminal	Cheongju, Chungbuk	0
3	Cheongju Int'l Airport	Cheongju, Chungbuk	0
4	Chungju Bus Terminal	Chungju, Chungbuk	0
5	Chungju City Hall	Chungju, Chungbuk	0
6	Hyundai Department Store Chungcheong	Cheongju, Chungbuk	0
7	Jeungpyeong-gun Office	Jeungpyeong-gun, Chungbuk	1
8	Cheongju St. Mary's Hospital	Cheongju, Chungbuk	2
9	Chungbuk National University Hospital	Cheongju, Chungbuk	0
10	Jecheon City Hall	Jecheon, Chungbuk	1
11	Jecheon Station	Jecheon, Chungbuk	2
12	Cheongju River Park Apt	Cheongju, Chungbuk	new
13	Jincheon Complex Terminal	Jincheon-gun, Chungbuk	1
14	Ochang Lake Park	Cheongju, Chungbuk	2
15	Lotte Outlet Cheongju	Cheongju, Chungbuk	0
16	Chungcheongbukdo Provincial Office	Cheongju, Chungbuk	-4
17	Danyang Dodamsambong	Danyang-gun, Chungbuk	1
18	Eumseong-gun Office	Eumseong-gun, Chungbuk	1
19	Daecheong Dam Observatory	Cheongju, Chungbuk	13
20	Emart Cheongju	Cheongju, Chungbuk	2
21	Cafe San	Danyang-gun, Chungbuk	-4
22	Jincheon-gun Office	Jincheon-gun, Chungbuk	2
23	Cheongju University	Cheongju, Chungbuk	-3
24	Home Plus Ochang	Cheongju, Chungbuk	-3
25	Cheongju City Office	Cheongju, Chungbuk	0

Restaurant TOP 50

Rank	Place	Region	change
1	Lee Sung Dang Main Branch	Gunsan, Jeonbuk	8
2	Joyang Bagjik	Ganghwa-gun, Incheon	-1
3	Donghwa Garden	Gangneung, Gangwon	1
4	Waveon Coffee	Gijang, Busan	-2
5	Dirty Trunk	Paju, Gyeonggi	20
6	Songchu Gamagol Main	Yangju-si, Gyeonggi	4
7	Tongnamujib Dakgalbi	Chuncheon, Gangwon	13
8	Bongpo meogurijip Main	Sokcho, Gangwon	-5
9	Sung Sim Dang Main Branch	Jung-gu, Daejeon	-4
10	Cheongchosu Mullhoe Sokcho Main	Sokcho, Gangwon	32
11	Ujin Haejanggook	Jeju, Jeju	6
12	Starbucks Riverside DT Paldang	Namyangju-si, Gyeonggi	new
13	Umjinae Pojangmacha	Gangneung, Gangwon	-6
14	Terarosa Coffee Factory	Gangneung, Gangwon	new
15	Seaside Garden	Goseong-gun, Gangwon	35
16	Ppeldabang	Ongjin-gun, Incheon	31
17	Twosome Place Changwon Gwisan	Changwon, Gyeongnam	17
18	Cafe Gleen Park	Gimpo, Gyeonggi	15
19	Oneunjeong Gimbap	Seogwipo-si, Jeju	17
20	Ilsan Kalguksu Main	Goyang, Gyeonggi	-5
21	Mainsuk Chicken Main	Sokcho, Gangwon	1
22	Ganggangsullae Neulbom Plantation Point	Goyang, Gyeonggi	-8
23	Soksiwonhan Daegutang	Haeundae-gu, Busan	-12
24	Masirang Cafe	Jung-gu, Incheon	-3
25	Bong Bread	Sokcho, Gangwon	-12
26	Cafe San	Danyang-gun, Chungbuk	-10
27	Gogiri Makguksu	Yongin, Gyeonggi	98
28	a loaf slice piece	Yongin, Gyeonggi	3
29	Yangjimal Hwarogui	Hongcheon-gun, Gangwon	-3
30	EDIYA Coffel Lab	Gangnam-gu, Seoul	-11
31	Bon Suwon Galbi Main Branch	Suwon, Gyeonggi	1
32	Mokhyang Won	Namyangju-si, Gyeonggi	7
33	Breadsong	Namyangju-si, Gyeonggi	new
34	Jirinseong	Gunsan, Jeonbuk	12
35	Gabojeong Galbi #1	Suwon, Gyeonggi	-7
36	Dumulmeori Yeon Hotdog	Yangpyeong-gun, Gyeonggi	60
37	For a day Cafe	Namyangju-si, Gyeonggi	4
38	9 Block View Paldang	Namyangju-si, Gyeonggi	38
39	Naju Gomtang Hayanjip	Naju-si, Jeonnam	4
40	Hayden Busan	Gijang, Busan	0
41	Jeju Kimmanbok Main Branch	Jeju, Jeju	-23
42	Onnuri Jangjakgui Paldang Main Branch	Namyangju-si, Gyeonggi	-4
43	Masian Bakery	Jung-gu, Incheon	new
44	Terra Rosa Coffe Seojong	Yangpyeong-gun, Gyeonggi	-32
45	Monsant de Aewol	Jeju, Jeju	-22
46	Hwanghae Haemul Kalguksu	Jung-gu, Incheon	26
47	High End Jeju	Jeju, Jeju	-17
48	Birugae	Namyangju-si, Gyeonggi	21
49	Gyeongnam Hotel Wedding Buffet	Dongdaemun-gu, Seoul	-4
50	Paldang Wonjo Kaljebi Kalguksu	Hanam, Gyeonggi	60

Tourist Attraction TOP 50

Rank	Place	Region	change
1	Eulwangri Beach	Jung-gu, Incheon	0
2	Daecheon Beach	Boryeong, Chungnam	2
3	Everland	Yongin, Gyeonggi	-1
4	Gwanganri Beach	Suyeong-gu, Busan	1
5	Haeundae Beach	Haeundae-gu, Busan	1
6	Jeonju Hanok Village	Jeonju, Jeonbuk	13
7	Wolmido	Jung-gu, Incheon	0
8	Sokcho Beach	Sokcho, Gangwon	new
9	Gangwon Land	Jeongseon-gun, Gangwon	-6
10	Songjeong Beach	Haeundae-gu, Busan	0
11	Anmok Beach	Gangneung, Gangwon	0
12	Yeongildae Beach	Pohang, Gyeongbuk	5
13	Gyeongpodae	Gangneung, Gangwon	-5
14	Korea Folk Village	Yongin, Gyeonggi	-5
15	Dongmak Beach	Ganghwa-gun, Incheon	3
16	Oido Red Lighthouse	Siheung, Gyeonggi	4
17	Heyri Art Village	Paju, Gyeonggi	-3
18	Gyeongpo Beach	Gangneung, Gangwon	6
19	Jebudo	Hwaseong, Gyeonggi	6
20	Daebudo	Ansan, Gyeonggi	11
21	Dadaepo Beach	Saha-gu, Busan	20
22	Ggotji Beach	Taean-gun, Chungnam	1
23	Hwangridangil	Gyeongju, Gyeongbuk	6
24	Jeongdongjin Beach	Gangneung, Gangwon	9
25	Yeosu Nangman Pocha Street	Yeosu, Jeonnam	-13
26	Suseongmot	Suseong-gu, Daegu	4
27	Mulwang Reservoir	Siheung, Gyeonggi	5
28	Seongsan Ilchulbong	Seogwipo-si, Jeju	-12
29	Nami Island	Gapyeong, Gyeonggi	-14
30	Juknokwon	Damyang-gun, Jeonnam	7
31	Achim Goyo Arboretum	Gapyeong, Gyeonggi	-5
32	Cheomseongdae	Gyeongju, Gyeongbuk	-4
33	Hamdeok Beach	Jeju, Jeju	6
34	Sanjeong Lake	Pocheon-si, Gyeonggi	11
35	Oido	Siheung, Gyeonggi	13
36	Seonyudo	Gunsan, Jeonbuk	0
37	Sinsa Garosugil	Gangnam-gu, Seoul	-16
38	Homigot	Pohang, Gyeongbuk	14
39	Hyeopjae Beach	Jeju, Jeju	-4
40	Songdo Beach	Seo-gu, Busan	7
41	Seorak Cable Car	Sokcho, Gangwon	-7
42	Suncheonman Bay National Garden	Suncheon, Jeonnam	9
43	Gangneung Cafe Street	Gangneung, Gangwon	-5
44	Lotte World	Songpa-gu, Seoul	-22
45	Gyeongju Bomun Tourist Complex	Gyeongju, Gyeongbuk	-1
46	Donggung Palace and Wolji Pond	Gyeongju, Gyeongbuk	-6
47	Majang Lake Suspension Bridge	Paju, Gyeonggi	-1
48	Hill of Wind	Geoje, Gyeongnam	6
49	Yeosu Maritime Cable Car	Yeosu, Jeonnam	-6
50	Muido	Jung-gu, Incheon	new

Cultral Attraction TOP 50

Rank	Place	Region	change
51	Seoul Arts Center	Seocho-gu, Seoul	0
52	The Independence Hall Of Korea	Cheonan, Chungnam	0
53	Osulloc Tea Museum	Seogwipo-si, Jeju	0
54	Hanwha Aqua Planet Jeju	Seogwipo-si, Jeju	6
55	Pocheon Art Valley	Pocheon-si, Gyeonggi	9
56	Caisson 24	Yeonsu-gu, Incheon	23
57	Yeosu Art Land Culture & Resort	Yeosu, Jeonnam	new
58	The Bay 101	Haeundae-gu, Busan	-2
59	Aqua Planet Yeosu	Yeosu, Jeonnam	0
60	Soliso	Namyangju-si, Gyeonggi	5
61	Sejong Center for the Performing Arts	Jongro-gu, Seoul	0
62	National Museum of Korea	Yongsan-gu, Seoul	23
63	KT&G Sangsangmadang	Mapo-gu, Seoul	new
64	Changwon Exhibition Convention Center	Changwon, Gyeongnam	4
65	KEPCO Art Center	Seocho-gu, Seoul	4
66	War Memorial of Korea	Yongsan-gu, Seoul	-4
67	Gyeonggi Children's Museum	Yongin, Gyeonggi	-9
68	Seoul Arts Center Hangaram Arts Center Museum	Seocho-gu, Seoul	-11
69	Gyeongju National Museum	Gyeongju, Gyeongbuk	14
70	AquaPlanet ILSAN	Goyang, Gyeonggi	new
71	Dongdaemun Design Plaza	Jung-gu, Seoul	-5
72	Korea Job World	Seongnam, Gyeonggi	-1
73	Gunsan Modern History Museum	Gunsan, Jeonbuk	7
74	Korea National Maritime Museum	Yeongdo-gu, Busan	7
75	SEA LIFE Busan Aquarium	Haeundae-gu, Busan	7
76	Goseong Dinosaur Museum	Goseong-gun, Gyeongnam	-2
77	Chungmu Arts Center	Jung-gu, Seoul	-5
78	Asia Culture Center	Dong-gu, Gwangju	17
79	Gwacheon National Science Museum	Gwacheon-si, Gyeonggi	-16
80	Chowon Studio	Gunsan, Jeonbuk	14
81	Jangsaengpo Whale Museum	Nam-gu, Ulsan	-6
82	AMI Art Museum	Dangjin-si, Chungnam	14
83	Lotte World Aquarium	Songpa-gu, Seoul	-13
84	KT&G Sangsangmadang	Mapo-gu, Seoul	-29
85	National Museum of Modern and Contemporary Art, Gwacheon	Gwacheon-si, Gyeonggi	20
86	LG Arts Center	Gangnam-gu, Seoul	6
87	Jeonju National Museum	Jeonju, Jeonbuk	33
88	MONAMOUR	Asan, Chungnam	new
89	Busan Cultural Center	Nam-gu, Busan	11
90	Seongnam Arts Center	Seongnam, Gyeonggi	-17
91	National Theater of Korea	Jung-gu, Seoul	-2
92	Daldongnae of Old Times	Gyeongju, Gyeongbuk	-6
93	Alive Museum Jeju	Seogwipo-si, Jeju	8
94	Korean Manhwa Museum	Bucheon, Gyeonggi	-18
95	Hall of Uijeongbu Arts	Uijeongbu, Gyeonggi	7
96	National Science Museum	Yuseong-gu, Daejeon	1
97	Incheon Culture & Arts Center	Namdong-gu, Incheon	1
98	Dream Theater	Nam-gu, Busan	73
99	National Museum of Modern and Contemporary Art - Seoul	Jongro-gu, Seoul	-21
100	Jeju Air and Space Museum	Seogwipo-si, Jeju	29

Shopping Center TOP 50

Rank	Place	Region	change
1	Starfield Hanam	Hanam, Gyeonggi	0
2	Starfield Goyang	Goyang, Gyeonggi	0
3	Hyundai Department Store Pangyo	Seongnam, Gyeonggi	2
4	IKEA Goyang	Goyang, Gyeonggi	-1
5	IKEA Gwangmyeong	Gwangmeyong, Gyeonggi	-1
6	Shinsegae Department Store Gangnam Branch	Seocho-gu, Seoul	1
7	Shinsegae Department Store Central City Branch	Haeundae-gu, Busan	-1
8	Costco Gongse	Yongin, Gyeonggi	0
9	IKEA Giheung	Yongin, Gyeonggi	new
10	Costco Hanam	Hanam, Gyeonggi	new
11	Costco Yangjae	Seocho-gu, Seoul	-2
12	Lotte Department Store Busan Main Branch	Busanjin-gu, Busan	3
13	Costco Ilsan	Goyang, Gyeonggi	0
14	Costco Gwangmyeong	Gwangmeyong, Gyeongg	-3
15	Time Square	Yeongdeungpo-gu, Seoul	5
16	Lotte Department Store Main Branch	Jung-gu, Seoul	-6
17	Galleria Timeworld	Seo-gu, Daejeon	9
18	Shinsegae Department Store Main Branch	Jung-gu, Seoul	1
19	Hyundai Department Store Apguejong Main Store	Gangnam-gu, Seoul	-3
20	Hyundai Department Store Mokdong	Yangcheon-gu, Seoul	-8
21	Shinsegae Department Store Gyeonggi Branch	Yongin, Gyeonggi	-4
22	IKEA DongBusan Store	Gijang, Busan	new
23	Starfield City Wirye	Hanam, Gyeonggi	19
24	Shinsegae Department Store Daegu Branch	Dong-gu, Daegu	-2
25	Emart Sihwa	Siheung, Gyeonggi	-2
26	Hyundai Department Store Jungdong Store	Bucheon, Gyeonggi	-5
27	Costco Uijeongbu	Uijeongbu, Gyeonggi	1
28	Costco Yangpyeong	Yeongdeungpo-gu, Seoul	7
29	Emart Traders Songrim	Dong-gu, Incheon	4
30	Lotte Department Store Incheon Terminal Store	Michuhol, Incheon	new
31	Costco Songdo	Yeonsu-gu, Incheon	-2
32	Costco Busan	Suyeong-gu, Busan	9
33	Costco Sejong	Sejong	-6
34	Lotte Mall Gimpo Airport Branch	Gangseo-gu, Seoul	-16
35	Emart Seongsu	Seongdong-gu, Seoul	-5
36	Starfield City Bucheon	Bucheon, Gyeonggi	new
37	Shindorim Techno Mart	Guro-gu, Seoul	-23
38	Costco Sangbong	Jungnang-gu, Seoul	-13
39	Techno Mart	Gwangjin-gu, Seoul	-7
40	Emart Gimpo Hangang	Gimpo, Gyeonggi	-9
41	Emart Traders Guseong	Yongin, Gyeonggi	-5
42	Emart Dongtan	Hwaseong, Gyeonggi	-3
43	Garden Five	Songpa-gu, Seoul	-19
44	Galleria West	Gangnam-gu, Seoul	3
45	Hyundai Department Store Trade Center Store	Gangnam-gu, Seoul	-2
46	Emart Traders KINTEX	Goyang, Gyeonggi	-8
47	Home Plus Yeongtong	Suwon, Gyeonggi	-13
48	La Festa	Goyang, Gyeonggi	-3
49	Emart Traders Wolgye	Nowon-gu, Seoul	new
50	Hyundai Department Store Kintex	Goyang, Gyeonggi	-13

Kakao T Taxi National Hot Places

Jul. 2019 ~ Jun. 2020, Based on completed
rides through POI search

National TOP 50

Rank	Departure	Region	change
1	Mirae Asset Center 1 Bldg	Jung-gu, Seoul	3
2	Itaewon Station Line 6	Yongsan-gu, Seoul	0
3	Gangnam Finance Bldg	Gangnam-gu, Seoul	7
4	Yuchang Bldg	Seocho-gu, Seoul	new
5	Seoul Central District Prosecutors' Office	Seocho-gu, Seoul	4
6	Itaewon 119 Safety Center	Yongsan-gu, Seoul	0
7	Itaewon Station Line 6 Exit 4	Yongsan-gu, Seoul	new
8	H-Squre(N)	Seongnam, Gyeonggi	4
9	Samsung Electronics Hwaseong Campus Entrance H3	Hwaseong, Gyeonggi	21
10	Conrad Seoul	Yeongdeungpo-gu, Seoul	-2
11	Jungheung S-Class Sky 31	Seo-gu, Gwangju	15
12	SK Hynix Cheongju 1st Plant	Cheongju, Chungbuk	34
13	Sadang Station Line 2 Exit 5	Gwanak-gu, Seoul	8
14	Jonggak Station Line 1 Exit 12	Jongro-gu, Seoul	-1
15	VHS Medical Center Station Line 9 Exit 3	Gangdong-gu, Seoul	new
16	OneIFC	Yeongdeungpo-gu, Seoul	6
17	Cheonan Asan Station	Asan, Chungnam	0
18	Hapjeong Station Line 6 Exit 8	Mapo-gu, Seoul	10
19	Beomnaegol Station Halla Vivaldi Studio 422	Busanjin-gu, Busan	31
20	Sinsa Station Line 3 Exit 8	Gangnam-gu, Seoul	13
21	Novotel Ambassador Seoul Yongsan	Yongsan-gu, Seoul	13
22	KT&G Sangsangmadang	Mapo-gu, Seoul	new
23	CGV Gangnam	Gangnam-gu, Seoul	-5
24	Seoul Square	Jung-gu, Seoul	1
25	LG Twin Tower	Yeongdeungpo-gu, Seoul	-1
26	Samsung Electronics Dormitory	Yongin, Gyeonggi	-7
27	Yeouido Station Line 5 Exit 3	Yeongdeungpo-gu, Seoul	11
28	KGIT Center	Mapo-gu, Seoul	8
29	Huimang Dream Apt	Donghae-si, Gangwon	11
30	Gasan Digital Complex Station Line 7 Exit 6	Geumcheon-gu, Seoul	2
31	Lotus Plaza	Bupyeong-gu, Incheon	34
32	Sangam DMC Digital Cube	Mapo-gu, Seoul	26
33	Signiel Seoul	Songpa-gu, Seoul	new
34	Arc Place	Gangnam-gu, Seoul	72
35	Signature Tower	Jung-gu, Seoul	6
36	D Tower	Jongro-gu, Seoul	55
37	Gimpo Int'l Airport Domestic Line	Gangseo-gu, Seoul	-30
38	Alphadom Tower	Seongnam, Gyeonggi	new
39	World Plaza	Suwon, Gyeonggi	13
40	Suseo Station SRT Exit 3	Gangnam-gu, Seoul	-13
41	Ramada Plaza Jeju	Jeju, Jeju	-10
42	NAVER Green Factory	Seongnam, Gyeonggi	90
43	Jeongja Station Bundang	Seongnam, Gyeonggi	10
44	Jeju Int'l Airport	Jeju, Jeju	-1
45	Dongtan Station	Hwaseong, Gyeonggi	-16
46	Gangnam Station DX Line Exit 5	Seocho-gu, Seoul	-2
47	Taeyoung Bldg	Yeongdeungpo-gu, Seoul	19
48	Seogyong Bldg	Songpa-gu, Seoul	8
49	Dongtan Station SRT Exit 2	Hwaseong, Gyeonggi	-33
50	Utop Ubless Officetel	Seo-gu, Gwangju	new

Rank	Destination	Region	change
1	Jeju Int'l Airport	Jeju, Jeju	2
2	U-square Gwangju Bus Terminal	Seo-gu, Gwangju	-1
3	Gimpo Int'l Airport Domestic Line	Gangseo-gu, Seoul	-1
4	Dongdaegu Station	Dong-gu, Daegu	1
5	Daejeon Station	Dong-gu, Daejeon	-1
6	Busan Station	Dong-gu, Busan	0
7	Seoul Station	Yongsan-gu, Seoul	1
8	Gwangju Songjeong Station	Gwangsan-gu, Gwangju	2
9	Gwangmyeong Station	Gwangmeyong, Gyeonggi	0
10	Daejeon Complex Terminal	Dong-gu, Daejeon	2
11	Cheonan Asan Station	Asan, Chungnam	3
12	Suwon Station	Suwon, Gyeonggi	9
13	Cheongju Bus Terminal	Cheongju, Chungbuk	2
14	Wonju Intercity Bus Terminal	Wonju, Gangwon	-1
15	Suseo Statioin	Gangnam-gu, Seoul	3
16	Galleria Timeworld	Seo-gu, Daejeon	1
17	Incheon Int'l Airport Terminal 1	Jung-gu, Incheon	-10
18	Yongsan Station	Yongsan-gu, Seoul	2
19	Gumi Station	Gumi, Gyeongbuk	-3
20	Suwon Station Line 1	Suwon, Gyeonggi	-9
21	Osong Station	Cheongju, Chungbuk	4
22	Incheon Bus Terminal Complex	Michuhol, Incheon	2
23	Jeonju Express Bus Terminal	Jeonju, Jeonbuk	-1
24	Cheonan Express Bus Terminal	Cheonan, Chungnam	-5
25	Iksan Station	Iksan-si, Jeonbuk	6
26	Jeju City Hall	Jeju, Jeju	1
27	Suwon Bus Terminal	Suwon, Gyeonggi	-4
28	Jeonju Bus Terminal	Jeonju, Jeonbuk	2
29	Cheonan Terminal	Cheonan, Chungnam	23
30	Jeonju Station	Jeonju, Jeonbuk	4
31	Pyeongtaek Station	Pyeongtaek, Gyeonggi	-2
32	Beomgye Station Line 4	Anyang, Gyeonggi	-6
33	Seoul Express Bus Terminal (Gyeongbu)	Seocho-gu, Seoul	-1
34	Ulsan Station	Ulju, Ulsan	7
35	Sillim Station Line 2	Gwanak-gu, Seoul	3
36	East Seoul Intercity Bus Terminal	Gwangjin-gu, Seoul	-3
37	Seodaejeon Station	Jung-gu, Daejeon	5
38	Gangneung Intercity Bus Terminal	Gangneung, Gangwon	2
39	Hongik University Station Line 2	Mapo-gu, Seoul	-4
40	Sangroksu Station Line 4	Ansan, Gyeonggi	10
41	Suseo Statioin SRT Exit 1	Gangnam-gu, Seoul	4
42	Hyundai Department Store Ulsan Store	Nam-gu, Ulsan	5
43	Gangneung Station	Gangneung, Gangwon	22
44	Asan Medical Center	Songpa-gu, Seoul	11
45	Bupyeong Station Line 1	Bupyeong-gu, Incheon	-8
46	Ansan Bus Terminal	Ansan, Gyeonggi	-2
47	Cheonan Station	Cheonan, Chungnam	6
48	Indeokwon Station Line 4	Anyang, Gyeonggi	-2
49	Gangnam Station Line 2	Gangnam-gu, Seoul	-10
50	Juan Station Line 1	Michuhol, Incheon	1

National TOP 50

Rank	Departure	Region	change
1	Mirae Asset Center 1 Bldg	Jung-gu, Seoul	2
2	Itaewon Station Line 6	Yongsan-gu, Seoul	-1
3	Gangnam Finance Bldg	Gangnam-gu, Seoul	6
4	Yuchang Bldg	Seocho-gu, Seoul	new
5	Seoul Central District Prosecutors' Office	Seocho-gu, Seoul	3
6	Itaewon 119 Safety Center	Yongsan-gu, Seoul	-1
7	Itaewon Station Line 6 Exit 4	Yongsan-gu, Seoul	65
8	Conrad Seoul	Yeongdeungpo-gu, Seoul	-1
9	Sadang Station Line 2 Exit 5	Gwanak-gu, Seoul	4
10	Jonggak Station Line 1 Exit 12	Jongro-gu, Seoul	0
11	VHS Medical Center Station Line 9 Exit 3	Gangdong-gu, Seoul	new
12	OneIFC	Yeongdeungpo-gu, Seoul	2
13	Hapjeong Station Line 6 Exit 8	Mapo-gu, Seoul	6
14	Sinsa Station Line 3 Exit 8	Gangnam-gu, Seoul	7
15	Novotel Ambassador Seoul Yongsan	Yongsan-gu, Seoul	7
16	KT&G Sangsangmadang	Mapo-gu, Seoul	new
17	CGV Gangnam	Gangnam-gu, Seoul	-5
18	Seoul Square	Jung-gu, Seoul	-1
19	LG Twin Tower	Yeongdeungpo-gu, Seoul	-3
20	Yeouido Station Line 5 Exit 3	Yeongdeungpo-gu, Seoul	4

Rank	Destination	Region	change
1	Gimpo Int'l Airport Domestic Line	Gangseo-gu, Seoul	0
2	Seoul Station	Yongsan-gu, Seoul	0
3	Suseo Statioin	Gangnam-gu, Seoul	0
4	Yongsan Station	Yongsan-gu, Seoul	0
5	Seoul Express Bus Terminal (Gyeongbu)	Seocho-gu, Seoul	1
6	Sillim Station Line 2	Gwanak-gu, Seoul	3
7	East Seoul Intercity Bus Terminal	Gwangjin-gu, Seoul	0
8	Hongik University Station Line 2	Mapo-gu, Seoul	0
9	Suseo Statioin SRT Exit 1	Gangnam-gu, Seoul	2
10	Asan Medical Center	Songpa-gu, Seoul	3
11	Gangnam Station Line 2	Gangnam-gu, Seoul	-1
12	Yeongdeungpo Station	Yeongdeungpo-gu, Seoul	3
13	Gimpo Int'l Airport Int'l Terminal	Gangseo-gu, Seoul	-8
14	Jamsil Station Line 2	Songpa-gu, Seoul	-2
15	Seoul National University Station Line 2	Gwanak-gu, Seoul	1
16	Itaewon Station Line 6	Yongsan-gu, Seoul	-2
17	Suyu Station Line 4	Gangbuk-gu, Seoul	1
18	Konkuk University Station Line 2	Gwangjin-gu, Seoul	-1
19	Central City Terminal (Honam Line)	Seocho-gu, Seoul	2
20	Samsung Medical Center	Gangnam-gu, Seoul	2

Gwangju TOP 10

Rank	Departure	Region	change
1	Jungheung S-Class Sky 31	Seo-gu, Gwangju	0
2	Utop Ubless Officetel	Seo-gu, Gwangju	new
3	Sangmu Riche 1 Officetel	Seo-gu, Gwangju	0
4	Nongseong Utop Ubless Apt	Seo-gu, Gwangju	-2
5	Central City Officetel	Seo-gu, Gwangju	0
6	Goldenvill Officetel	Seo-gu, Gwangju	1
7	Landpia Officetel	Seo-gu, Gwangju	1
8	Utop Ubless Twin City Officetel	Seo-gu, Gwangju	new
9	Sangmu Riche 2-cha Officetel	Seo-gu, Gwangju	new
10	Gyelim Credit Coop Head Office	Dong-gu, Gwangju	2

Rank	Destination	Region	change
1	U-square Gwangju Bus Terminal	Seo-gu, Gwangju	0
2	Gwangju Songjeong Station	Gwangsan-gu, Gwangju	0
3	NC Wave Chungjang	Dong-gu, Gwangju	0
4	Megabox Gwangju Sangmu	Seo-gu, Gwangju	0
5	Shinsegae Department Store Gwangju Branch	Seo-gu, Gwangju	0
6	U-square Gwangju Complex Bus Terminal	Seo-gu, Gwangju	new
7	Suwan Police Division	Gwangsan-gu, Gwangju	0
8	ex-City Hall Intersection	Dong-gu, Gwangju	1
9	Gwangju Airport	Gwangsan-gu, Gwangju	-1
10	Jeoncheolwoo Sageori	Buk-gu, Gwangju	2

Daegu TOP 10

Rank	Departure	Region	change
1	Chimsan Taewang Honors Rodem Officetel	Buk-gu, Daegu	0
2	Hwaseong Park Dream City Officetel	Jung-gu, Daegu	39
3	Dongdaegu Yuseong Purnaim Officetel	Dong-gu, Daegu	15
4	Samdeok 119 Safety Center	Jung-gu, Daegu	1
5	Mark Palace Beomeo Officetel	Suseong-gu, Daegu	44
6	Inter-Burgo Koasis Officetel	Jung-gu, Daegu	3
7	Nomaz House Officetel	Jung-gu, Daegu	17
8	Gyeseong High School	Seo-gu, Daegu	-6
9	Boutique City Drama Officetel	Dong-gu, Daegu	88
10	1006, Chimsan Hwaseong Park Dream Apt	Buk-gu, Daegu	new

Rank	Destination	Region	change
1	Dongdaegu Station	Dong-gu, Daegu	0
2	Daegu Int'l Airport	Dong-gu, Daegu	0
3	Samdeok 119 Safety Center	Jung-gu, Daegu	0
4	Dongdaegu Station Intermodal Transfer Center	Dong-gu, Daegu	1
5	Shinsegae Department Store Daegu Branch	Dong-gu, Daegu	-1
6	Hyundai Department Store Daegu	Jung-gu, Daegu	0
7	Daegu Seobu Station	Nam-gu, Daegu	0
8	Daegu Station	Jung-gu, Daegu	1
9	Dongdaegu Terminal	Dong-gu, Daegu	-1
10	Yeongnam University Hospital	Nam-gu, Daegu	1

Daejeon TOP 10

Rank	Departure	Region	change
1	Lotte City Hotel Daejeon	Yuseong-gu, Daejeon	0
2	Donggi Forever Apt	Seo-gu, Daejeon	new
3	Triple City 9 Danji Seomun Shopping Center	Yuseong-gu, Daejeon	0
4	Yeokjeon Drung Store	Dong-gu, Daejeon	-2
5	Triple City 9 Danji Jeongmun Shopping Center	Yuseong-gu, Daejeon	0
6	Seonhwa 2 Chamjoeun Apt	Jung-gu, Daejeon	1
7	Yuseong Nonghyup Hanaro Mart Gungdong	Yuseong-gu, Daejeon	1
8	Daejeon Catholic Social Welfare Center	Daedeuk-gu, Daejeon	new
9	Honorsville Officetel	Seo-gu, Daejeon	new
10	BS Tower	Yuseong-gu, Daejeon	2

Rank	Destination	Region	change
1	Daejeon Station	Dong-gu, Daejeon	0
2	Daejeon Complex Terminal	Dong-gu, Daejeon	0
3	Galleria Department Store Timeworld	Seo-gu, Daejeon	0
4	Seodaejeon Station	Jung-gu, Daejeon	0
5	Yuseong Express Bus Terminal	Yuseong-gu, Daejeon	0
6	Yuseong Intercity Bus Station	Yuseong-gu, Daejeon	new
7	Lotte Department Daejeon	Seo-gu, Daejeon	0
8	Sintanjin Station	Daedeuk-gu, Daejeon	1
9	Daejeon Station East Square	Dong-gu, Daejeon	-1
10	Chungnam National University Hospital	Jung-gu, Daejeon	2

Busan TOP 10

Rank	Departure	Region	change
1	Beomnaegolyeok Halla Vivaldi STUDIO422	Busanjin-gu, Busan	0
2	The Blue Officetel	Busanjin-gu, Busan	39
3	Seomyeon DS Hyupsung Elysian	Busanjin-gu, Busan	15
4	Haeundae Vernaum Officetel	Haeundae-gu, Busan	1
5	Park Hyatt Busan	Haeundae-gu, Busan	44
6	The Sharp Centum Star Apt	Haeundae-gu, Busan	3
7	Hanil Ordew Officetel	Haeundae-gu, Busan	17
8	Cube-i Officetel	Yeonjae-gu, Busan	-6
9	Yeonsandong Wellmade Officetel	Yeonjae-gu, Busan	88
10	Hilton Busan	Gijang-gun, Busan	new

Rank	Destination	Region	change
1	Busan Station	Dong-gu, Busan	0
2	Gimhae Int'l Airport	Gangseo-gu, Busan	0
3	Gimhae Int'l Airport Domestic Line	Gangseo-gu, Busan	0
4	Lotte Department Store Busan Main Branch	Busanjin-gu, Busan	1
5	Busan Seobu Bus Terminal	Sasang-gu, Busan	-1
6	Shinsaegae Department Store Centum City	Haeundae-gu, Busan	0
7	Judies Taehwa	Busanjin-gu, Busan	0
8	Hadan Station Busan Line 1	Saha-gu, Busan	1
9	Lotte Department Store Gwangbok	Jung-gu, Busan	-1
10	NC Department Store Seomyeon	Busanjin-gu, Busan	1

Ulsan TOP 10

Rank	Departure	Region	change
1	Taehwagang River Terras Officetel	Nam-gu, Ulsan	0
2	Hyundai Munhwa 2-cha Apt	Nam-gu, Ulsan	new
3	Samsan Rocoa Rubella Che Officetel	Nam-gu, Ulsan	0
4	Hyundai Munhwa 1-cha Apt	Nam-gu, Ulsan	-2
5	Beonyeongro Dreampark Officetel	Jung-gu, Ulsan	0
6	Donggwang Morning Sky Officetel	Nam-gu, Ulsan	1
7	Taehwagang Exordium Apt	Jung-gu, Ulsan	1
8	Ulsan Sinjeongdong Sinjeong G-Well	Nam-gu, Ulsan	new
9	Seven Eleven Ulsan Samsan Koaru	Nam-gu, Ulsan	new
10	Hogye Station	Buk-gu, Ulsan	2

Rank	Destination	Region	change
1	Ulsan Station	Ulju-gun, Ulsan	0
2	Hyundai Department Store Ulsan	Nam-gu, Ulsan	0
3	Ulsan Intercity Bus Terminal	Nam-gu, Ulsan	0
4	Lotte Department Store Ulsan	Nam-gu, Ulsan	0
5	Upsquare	Nam-gu, Ulsan	0
6	Taehwagang Station	Nam-gu, Ulsan	new
7	Ulsan University	Nam-gu, Ulsan	0
8	Ulsan Airport	Buk-gu, Ulsan	1
9	Ulsan Express Bus Terminal	Nam-gu, Ulsan	-1
10	Donggang Hospital	Jung-gu, Ulsan	2

Incheon TOP 10

Rank	Departure	Region	change
1	Lotus Plaza	Bupyeong-gu, Incheon	0
2	Twosome Place Bupyeong	Bupyeong-gu, Incheon	39
3	Guwol Asia De The Blue City	Namdong-gu, Incheon	15
4	Bupyeong Hyundai The Loft	Bupyeong-gu, Incheon	1
5	Lotte Castle Campus Town Officetel 202 Dong	Yeonsu-gu, Incheon	44
6	Residence Like Home	Yeonsu-gu, Incheon	3
7	Posco Tower Songdo	Yeonsu-gu, Incheon	17
8	Technopark Station Incheon Line 1 Exit 3	Yeonsu-gu, Incheon	-6
9	Technopark Station Incheon Line 1 Exit 2	Yeonsu-gu, Incheon	88
10	Nonhyun Prugio City 2-cha Officetel	Namdong-gu, Incheon	new

Rank	Destination	Region	change
1	Incheon Int'l Airport Terminal 1	Jung-gu, Incheon	0
2	Incheon Bus Terminal Complex	Michuhol-gu, Incheon	0
3	Bupyeong Station Line 1	Bupyeong-gu, Incheon	0
4	Juan Station Line 1	Michuhol-gu, Incheon	1
5	Geomam Station Airport Express	Seo-gu, Incheon	-1
6	Incheon Int'l Airport Terminal 2	Jung-gu, Incheon	0
7	Gyeyang Station Airport Express	Gyeyang-gu, Incheon	0
8	Cheongra International City Station Airport Express	Seo-gu, Incheon	1
9	Guwoldong Rodeo Street	Namdong-gu, Incheon	-1
10	Lotte Department Store Incheon Terminal	Michuhol-gu, Incheon	1

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13th floor, Alphadom Tower, 152, Pangyoyeok-ro, Bundang-gu,
Seongnam-si, Gyeonggi-do, Republic of Korea

Writers

General Manager
Kunwoo Kim_Gunn, Jungmin Kim_Dominic,
Jeongwha Lee_Lia, Hyojin Choi_Jane

Planning and Writing
Yeseul Kim_Hazel, Sangwon Do_Robin, Yunhye Sung__Yune,
Seongwon Yun_Santiago, Soungwoo Lee_Mark,
Seyoung Lee_Winnie, Jinwon Lee_Bisma

Data Analysis
Dongil Kim_Bob, Migyung Kim_Shae, Sangho Kim_Crong,
Suyong Kim_Iron, Jinhui Lee_Jenny, Hyuncheol Ha_Kai

Design
Somi Woo_Cottony, Yena Kim_Yennie

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Digital Economy Research Institute of Kakao Mobility | Chief economist Kunwoo Kim T:82-31-628-7135 E:guun.kim@kakaomobility.com

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