Report of the State Comptroller of Israel | July 2024

Ministry of Communications

# Cellular Communication Infrastructure

# Cellular Communication Infrastructure

## Background

Cellular communication infrastructures are essential for maintaining a normal lifestyle and developing the Israeli economy and industry. The implementation of advanced cellular infrastructures promotes initiatives in various sectors, including health, transportation, and agriculture, resulting in economic benefits. The cellular market is regulated through licenses issued by the Ministry of Communications to cell companies under the Communications (Telecommunications and Broadcasting) Law, 1982, and the Wireless Telegraph Ordinance [New Version], 1972, permitting the use of a limited state resource – radio frequencies. As stipulated in these licenses, cell companies are obligated to establish cellular broadcasting installations and ensure coverage across areas via cellular communication networks, thereby delivering reliable service to the public while accommodating the increasing volume of cellular data consumption in Israel. Cellular communication technology is categorized by "generations" (from 2 to 5), with any significant technological advancement necessitating a redeployment or enhancement of the physical communication system classified as a new generation. The transition between generations enables the evolution of new services and the enhancement of existing services and user experiences. The Ministry of Environmental Protection issues, under the Non-Ionizing Radiation Law, 2006, construction and operating permits for cellular broadcasting installations (antennas) and supervises the compliance of cell companies with permit conditions.

## Key Figures

**NIS 9.1 billion**

cellular infrastructure companies' revenues in Israel in 2022

**64th place out of 145**

Israel's rank in the median mobile download speed index out of 145 countries as of August 2023

**0 financial sanctions**

imposed by the Ministry of Communications on cellular infrastructure companies regarding cellular coverage

**8,262**

active cellular broadcasting installations (antennas) in Israel – as of July 2023

**over 17 years**

the Ministers of Environmental Protection have not regulated maximum exposure levels to radiation from cellular broadcasting installations, as required by law

**only 3% of local authorities**

declared that reception in the residential neighborhoods under their jurisdiction is good

**55% of residents**

in 18, local authorities reported reception difficulties in internet usage on cell phone (without a wireless internet network)

**53%**

of peripheral Arab communities have no 5G technology broadcasting installations (local authorities with 10,000 or more residents)

# Audit Actions

From February to July 2023, the State Comptroller's Office audited cellular communication infrastructures, including obligations of cellular companies and their supervision; Planning, licensing, and placement of cellular broadcasting installations; Protection against radiation from cellular broadcasting installations; And cellular communication infrastructure utilizing 5th generation technology. The audit was conducted at the Ministry of Communications, with completion examinations carried out at the Ministry of Environmental Protection, the Ministry of Health, the Ministry of Finance, the Ministry of Transport and Road Safety, the Planning Administration, and the following municipalities: **Harish**, **Beit Shemesh**, **Rahat**, **Modi'in-Maccabim-Re'ut**, **Baqa al-Gharbiyye**, and **Herzliya**.

Additionally, data and information were collected from local authorities and residents using two audit tools. An internet survey combined with telephone interviews was conducted from September to October 2023 among 2,139 residents across 18 local authorities in Israel. This survey focused on the nature and quality of cell reception, interviewing a representative sample of the local authority surveyed. A questionnaire distributed to 35 local authorities, adequately representing districts, municipalities, local authorities, and regional councils. The questionnaire addressed the quality of cell reception within the authority's territory as of July 2023, public inquiries regarding cell reception, and the establishment of cellular broadcasting installations on properties owned by the local authority. 32 local authorities respondes to the questionnaire.

# Key Findings

**Quality of the Cellular Infrastructure**

- As of August 2023, Israel ranks 64th among 145 countries in the median download speed index for mobile browsing.
- The Ministry of Communications has not exercised its authority to impose financial sanctions on cellular infrastructure companies concerning their cellular coverage obligations.

## Cellular Coverage and its Quality

- **The Ministry of Communications' Data on Cellular Coverage and its Quality**

  The Ministry of Communications has delineated in the licenses for operators of mobile radio telephone, specific obligations to reliably deliver services to their subscribers, ensuring quality that meets the standards outlined in their licenses. Additionally, the Ministry has established coverage obligations in the licenses granted to cellular infrastructure companies, when as of February 2023, these companies are required to comply with coverage obligations for 4th generation technology, ensuring coverage for 99% of the population. This includes providing coverage for 95% of the area within each local authority and coverage ranging from 80% to 95% for roads. It was found that:

  - The Ministry of Communications does not require cellular infrastructure companies to provide coverage data, settling for reports relying on their projections, which may not accurately reflect cell reception. In March 2023, cellular infrastructure companies reported meeting coverage obligations in 98.9% to 100% of local authorities. However, significant discrepancies were identified between these reports and audit findings on cell reception, as detailed below.

  - Until 2023, the Ministry did not evaluate the accuracy of the reports submitted by cellular companies regarding compliance with coverage obligations in their licenses. There was no assessment of compliance based on actual data or projections.

  - The Ministry of Communications' information, was based solely on the cellular infrastructure companies' projections. Hence it is insufficient to draw reliable conclusions regarding their adherence to the obligations outlined in their licenses related to cellular coverage and network quality. Consequently, the Ministry cannot perform comprehensive supervision of the companies or determine whether there is justification for imposing financial sanctions for non-compliance.

- **Cellular Coverage and Quality**

  - In the analysis of cell reception quality in Israel, it was found that the public faced challenges regarding cell reception in various local authorities, resulting in moderate to poor reception and malfunctions while using cellular phones. These findings were generated from responses provided by local authorities to the State Comptroller's Office questionnaire, consultations with local authorities' engineering units, and a survey conducted among residents. Specifically, 28% of responding authorities reported reception difficulties in

their jurisdictions; 37% of surveyed residents indicated that cell reception in their homes was average or poor, while 50% experienced malfunctions when attempting to use their cell phones within a month before the survey. Additionally, 29% reported moderate or poor cell reception outside their homes, and 42% experienced malfunctions while attempting to make calls outdoors during the same period. Furthermore, 37% reported difficulties in contacting them due to reception issues at home or in their residential areas, and 55% reported challenges using the internet on their cell phones without a wireless internet connection.

  - Significant discrepancies were identified between the the Ministry of Communications' data, by which the quality of reception is generally good or even optimal, and the reports from local authorities and residents regarding actual cell reception quality. For instance, in the 18 local authorities surveyed, 11% to 78% of respondents experienced moderate or poor cell reception outside their homes, contrary to the Ministry's claim that cellular coverage in these areas ranges from 99.92% to 100%, indicating full or nearly complete coverage.

  - These audit findings raise concerns that the cellular infrastructure companies do not meet the coverage and reception threshold required by the licenses.

- **Cell Reception in Judea and Samaria –** the State Comptroller's Office survey in May 2022 on the security of residents in Judea and Samaria on the traffic routes, found that 81% of respondents reported little to moderate cellular coverage in their regular travel areas.

- **Cell Reception in Bomb Shelters –** cell reception may be inadequate in sheltered structures, hindering mobile phone use for those staying in such buildings. In November 2023, the Ministry of Communications issued a public notice regarding the possibility of conducting cellular calls in sheltered structures with weak reception (such as bomb shelters or apartment shelters) using Wi-Fi calling technology. However, this option is conditional and may not adequately address all instances where the public needs mobile phone access within sheltered structures.

- **Complaints Regarding Cell Reception Difficulties –** complaints received by the Ministry of Communications regarding cell reception difficulties for two and a half years indicated issues concentrated in 21 specific local authorities and neighborhoods, inconsistent with the data provided by cellular infrastructure companies. Nonetheless, the Ministry did not demand that the cellular infrastructure companies provide accurate data (as opposed to projections) on cell reception in the above local authorities and neighborhoods and did not independently verify cellular coverage in these areas.

- **Transparency of Information Regarding Cellular Service Coverage and Quality –** it was found that the Ministry of Communications does not publish the coverage data it possesses, including projections from cellular infrastructure

companies. Furthermore, the Ministry has not published the findings, either through maps or any other means, related to cellular coverage along Route 40 and Route 13 (in the Eilat and Arava area), as raised in inspections conducted in October 2022.

**Planning, Licensing, and Placement of Cellular Broadcasting Installations**

- **Shortage of Broadcasting Installations –** according the Ministry of Communications' information in May 2023, there is a shortage of thousands of broadcasting installations in Israel. However, the Ministry lacks comprehensive data on all the missing broadcasting installations, particularly at the local level, which is essential for providing quality cellular services to the public.

- **Amendment No. 128 to the Planning and Building Law –** Amendment 128 established a licensing track for cellular broadcasting installations through the National Infrastructure Commission. As of June 2023, this licensing track, established by the amendment enacted in January 2022, had not been utilized.

- **Updating the National Outline Plan –** in August 2021, the government instructed the Ministry of Communications and the National Council for Planning and Building to promote changes to the national outline plan for small and miniature broadcasting installations (NOP 36/A). However, about two years later, the Planning Administration and the Ministry of Communications have not completed the implementation of this decision, mainly due to the Ministry's failure to provide the Planning Administration with a professional planning team, due to budgetary shortage for hiring the team's services.

- **Placement of Broadcasting Installations on Government Buildings –** the government's resolution from August 2021 to promote the establishment of cellular broadcasting installations atop government housing buildings was minimally implemented. The number of broadcasting installations on these buildings increased from 11 to only 17 between January 2021 and June 2023. Additionally, during the two years from August 2021 to the audit end, the ministers of communications did not report to the government of the implementation of the decision according to the format set out in the government decision.

- **Broadcasting Installations in the Territories of Local Authorities**

  - **Placement of Broadcasting Installations on Local Authority Buildings –** 59% of authorities responding to the questionnaire did not install broadcasting installations on buildings or land owned or leased by the authority. In situations where cell reception quality is inadequate, and no broadcasting installations exist on authority properties, there is a concern that the authority does not increase the number of broadcasting installations in its area despite the potential for such an increase to enhance cellular coverage and reception quality for residents.

- **Collection of Rental Fees for Broadcasting Installation Placement –** a discrepancy was noted in the average rental fees for broadcasting installation placement across nine local authorities, with differences reaching up to 400% (ranging from NIS 2,083 per month in Elad to NIS 10,583 per month in Herzliya). Furthermore, the gap in average monthly rent paid by one cellular company to various local authorities in 2023 reached up to 500%. These disparities indicate significant differences in the rental fees demanded by local authorities when imposing disproportionately high rental fees compared to local authorities with similar characteristics, which may lessen a cellular company's incentive to install a broadcasting installation within its jurisdiction.

- **Planning Cellular Infrastructure in New Local Authorities and New Residential Neighborhoods –** the Planning and Building Law, 1965, permits planning authorities to include guidelines regarding cellular communication infrastructure in their plans; However, it does not mandate this inclusion. Twelve out of thirty-two authorities (37%) responded in the questionnaire that no guidelines were established for erecting cellular antennas in the plans related to neighborhoods that were planned, constructed, or inhabited between 2019 and 2023. Including guidelines pertaining to cellular broadcasting installations in plans for new local authorities and neighborhoods that may enhance service quality for residents upon initial occupation and potentially mitigate objections to establishing cellular facilities in designated areas. Some authorities reported that cell phone coverage in the neighborhoods was moderate or low after the building and population.

- **Planning Cellular Infrastructure in Tunnels –** in August 2022, Highway 16 at the entrance to Jerusalem opened to traffic; However, the road tunnel's cell reception regulations were not established until May 2023. Consequently, the Ministry of Transport has decided that future projects involving tunnels will require executing plans incorporating cellular communication infrastructure. As of August 2023, this decision has yet to be anchored officially by the Ministry of Transport.

**Protection Against Radiation from Cellular Broadcasting Installations**

In 2011, the World Health Organization's International Agency for Research on Cancer classified non-ionizing radiofrequency radiation as a potential carcinogen in humans, a classification still recognized in 2023.

- **Determining Maximum Exposure Levels to Radiation from Cellular Broadcasting Installations**

  - **Enactment of Regulations –** for over 17 years, regulations have not defined the maximum permissible exposure levels for humans to radiation from radio frequency sources (radiation from cellular broadcasting installations), as stipulated by the Non-Ionizing Radiation Law, 2006. Maximum exposure levels are set in rules published by the Radiation Commissioner in the Ministry of

Environmental Protection in 2009 and in the operating permits issued by the Radiation Commissioner.

- **Determining Maximum Exposure Levels Without the Involvement of the Ministry of Health –** the Ministry of Environmental Protection consulted the Ministry of Health regarding maximum exposure levels in 2007 while the latter was formulating draft regulations. Since then, for about 17 years, there has been no consultation on the matter between these two ministries. During this period, the Ministry of Environmental Protection established maximum exposure levels to radiation from cellular broadcasting installations in 2009 and ratified these rules in 2010 and 2020 without consulting the Ministry of Health, which is responsible for public health, and without rendering its opinion.

- **Formation of National Knowledge on the Health Consequences of Non-Ionizing Radiation –** Israel lacks a governmental entity dedicated to the health effects of non-ionizing radiation. Following the closure of the "Tnuda" knowledge center in 2022, there is no source of research information available to government ministries on the subject, also for informing and educating the public.

- **Examination of Health Aspects Regarding the Deployment of Fifth-Generation (5G) Infrastructure –** the Ministry of Health did not participate in the inter-ministerial team operating within the Ministry of Communications beginning in August 2020, at the initiative of the Ministry of Health to assess the health implications of radiation exposure from cellular infrastructure utilizing 5G technology. Consequently, the Ministry of Health did not formulate the team's decisions regarding health risks associated with deploying 5G technology. Although the Ministry of Health considered the "Tnuda" center as its representative within the team, concerns have been raised regarding the potential for decisions affecting public health to be made without direct involvement from the Ministry.

**Monitoring Radiation from Broadcasting Installations**

- **Measuring Radiation Intensity in Practice –** the Ministry of Environmental Protection monitors radiation emissions from cellular broadcasting installations using four methods, one of which includes a "continuous monitoring system" linked to the radio switches of cellular infrastructure companies. It was noted that the Ministry's only independent monitoring measure assessing actual radiation intensity in the field was implemented on less than 1% of active broadcasting installations in 2020–2022.

- **Collection of Fees Vis-a-Vis the Allocation of Supervision Resources –** the Ministry of Environmental Protection collects annual fees from cell companies in exchange for permits to construct and operate cellular broadcasting installations, which was about NIS 8 million in 2021 and NIS 11.3 million in 2022. However, these

fees are transferred to the State Treasury and are not allocated as the Ministry's resources for monitoring purposes. Consequently, these payments are inaccessible to the Ministry of Environmental Protection for monitoring broadcasting installations. The Ministry of Environmental Protection indicates that it lacks data on the total budget for monitoring radiation from cellular broadcasting installations in those years. However, the Ministry of Environmental Protection's data indicate that the budget for the calibration of measuring devices and the budget for the continuous monitoring system combined was about 11.5% of the cellular permit fees collected in 2021 and about 8% of the fees collected in 2022.

- **Publication of Information About Radiation from Cellular Broadcasting Installations –** the Ministry is not in compliance with the Non-Ionizing Radiation Law, 2006, and its associated regulations, as it has failed to publish data about the actual radiation intensity of broadcasting installations to the public.

- **Information to the Public –** providing adequate information regarding the health consequences of non-ionizing radiation and the necessity for additional broadcasting installations to mitigate radiation exposure levels may significantly reduce public objections and facilitate the expansion of cellular infrastructure. However, the relevant government ministries – the Ministry of Communications, the Ministry of Environmental Protection, and the Ministry of Health – do not recognize their responsibility for carrying out such outreach initiatives, nor have they established any requirements for outreach activities. According to findings from the State Comptroller's Office questionnaire to local authorities, outreach activities were not conducted in 91% of the local authorities that responded between 2019 and 2023.

**Cellular Communication Infrastructures Through 5th Generation Technology**

The 5th generation technology facilitates rapid data downloading and uploading and enhances cellular service capabilities that were unattainable in earlier generations.

- **Deployment of 5th Generation Infrastructure –** from August 2020 to the end of 2020, 762 broadcasting installations utilizing 5th-generation technology were established. Additionally, the companies awarded deployment grants in the 5th generation tender received, cumulatively, NIS 200 million, disbursed at the end of 2022. As of July 2022, the average coverage of 5th-generation cellular networks in households within the European Union was about 80% (coverage in at least one network), while in Israel, cellular infrastructure providers (except for one) were required to achieve 70% coverage of the population in residential areas and 65% coverage of residential areas by October 2023 within the 700 MHz frequency bands allocated in the 5G tender. Furthermore, they were required to achieve deployment in statistical areas that will provide them with at least 200 points within the frequency bands ranging from 3,500 to 3,800 MHz allocated in the 5G tender. However, as of October 2023, the Ministry of Communications had not received

coverage data for 5G technology, enabling it to assess compliance with license obligations or determine whether sanctions were necessary. The rates of deployment and operation of the installations above suggest, as of July 2023, that the scope of deployment did not align with the Ministry of Communications' licensing requirements, and Israel's coverage rate with this technology is lower than that of the previous year in most EU countries, with 1,943 active 5G broadcasting installations in Israel at that time.

- **Geographical Distribution of 5th Generation Infrastructures –** an analysis of active 5th generation broadcasting installations relative to population size raised significant disparities between large and peripheral local authorities. Notable gaps existed among more significant peripheral local authorities with populations exceeding 100,000, with discrepancies reaching 285% (comparing **Tel Aviv-Jaffa**, which had 5.86 installations per 10,000 residents, with **Bat Yam**, at 1.52 installations per 10,000 residents). In peripheral local authorities with populations under 10,000, the gap widened to 692% (comparing **Eilat**, at 6.89 installations per 10,000 residents, with **Netivot**, at 0.87 installations per 10,000 residents). The most alarming findings were raised regarding infrastructure in Arab settlements: as of July 2023, 44 out of 58 (76%) peripheral Arab local authorities had no active 5th-generation broadcasting installations. Additionally, disparities were evident in peripheral local authorities (populations of 10,000 or greater) between Arab and non-Arab local authorities, as Arab ones have less than one-fifth of the average number of installations compared to Jewish ones.

**Supervision of the Ministry of Communications over Cellular Companies**

- **Supervision Methodology –** as of the audit date, the supervisory authorities at the Ministry of Communications lack a methodology and tools for assessing the compliance of cellular infrastructure companies with the cellular coverage obligations outlined in their licenses.

The State Comptroller's Office commends the inter-ministerial team, led by the Ministry of Communications, established in December 2020, for its efforts in promoting legislative amendments to enhance the planning and licensing processes for cellular infrastructure in Israel.

The State Comptroller's Office also commends the Ministry of Communications for its initiatives to foster competition among cellular operators by reducing barriers to subscriber transition and facilitating the entry of virtual operators into the market since 2010, resulting in lower subscription prices for consumers charged by cellular infrastructure companies.

Furthermore, the State Comptroller's Office commends the initiatives of the Ministry of Environmental Protection in operating the "continuous monitoring system" – a computerized framework that remains connected to the radio switches of cellular companies, designed to retrieve data on the broadcasting capacities of each facility.

## Key Recommendations

- Given the anticipated increase in cellular data consumption in the coming years, the Ministry of Communications should prioritize enhancing cellular service quality in Israel.
- The Ministry of Communications should obtain regular and comprehensive data from cellular infrastructure companies regarding the actual cellular coverage of their networks, as well as data about the quality of these networks. This data should be analyzed continuously, and an independent audit should be conducted to ensure that the companies comply with their license obligations. Such measures will enable adequate supervision and enforcement of the obligations imposed on cellular infrastructure companies under their licenses.
- Additionally, it is recommended that the Ministry utilize surveys and questionnaires to identify discrepancies between its data and actual reception reports from the public and local authorities, and address these disparities.
- The Ministry of Communications, in collaboration with the Civil Administration in Judea and Samaria, should complete cellular coverage on the roads of Judea and Samaria, as stipulated in the licenses awarded to the cellular infrastructure companies operating in this region. Completing cellular coverage is essential in a high-risk area where security incidents and terror attacks occur frequently.
- It is recommended that the Ministry of Communications publish information on cellular coverage levels in Israel, including quality data at the local level derived from independent testing. Regular updates should reflect any new findings based on the data maintained by the Ministry.
- The Ministry of Communications should compile data on the scope of necessary broadcasting installations to ensure high-quality cell reception, categorized by geographic areas and local authorities, and subsequently establish broadcasting installations in areas where they are insufficient.
- The Ministry of Communications and the Planning Administration should expedite the update of NOP 36/A (the national outline plan for small and miniature broadcasting installations) under Government Resolution 209 of August 1, 2021, to align the plan with public needs in mobile communications. Hence, the Ministry should allocate a budget to support the implementation of the government's resolution. At the same time, the Planning

Administration should convene the Draft Committee to form and approve the plan by the governmental.

- Local authorities and the Ministry of Construction and Housing should ensure that both outline and detailed plans for the new neighborhood adequately address the requirements for cellular infrastructure. Furthermore, it is recommended that the Planning Administration, in collaboration with the Ministry of Communications and the Ministry of Justice, regulate by incorporating a mandate within local outline plans and detailed plans to guarantee the necessary cellular infrastructure response.
- The Minister of Environmental Protection should enact regulations concerning permissible radiation exposure levels from cellular broadcasting installations, following consultations with the Minister of Health and the Minister of Communications, as mandated by the Non-Ionizing Radiation Law, 2006.
- The Ministry of Health, responsible for safeguarding public health in Israel, should systematically compile and continuously update professional information regarding the effects of non-ionizing radiation on public health, ensuring this information is accessible to both the public and relevant government ministries involved in mobile communication infrastructure deployment, as well as in monitoring and controlling the activities of mobile communication installations.
- It is recommended that the Ministry of Environmental Protection and the Ministry of Finance collaborate to secure an adequate budget for monitoring operations related to broadcasting installations, considering the collection of fees from cellular companies in exchange for permits for the construction and operation of broadcasting installations. Additionally, the Ministry should enhance supervisory operations to ensure compliance with the maximum power limits established by the Ministry.
- The Ministry of Environmental Protection should publicly disclose the data regarding radiation measurement results and inspections of radiation sources under the Non-Ionizing Radiation Law, 2006.
- The Ministry of Communications, the Ministry of Environmental Protection, and the Ministry of Health should develop a standardized format for informing the public about the health impacts of radiation from cellular broadcasting installations. This includes identifying the responsible party for disseminating this information, outlining specific tasks, and ensuring accountability for task completion. Should there be a lack of consensus among the ministries on these issues, the matter should be addressed through a governmental resolution.
- The Ministry of Communications should collect data on the number of 5G broadcasting installations required to ensure adequate service quality for the public and assess the cellular coverage of these installations. The Ministry should enforce cellular companies' compliance with their licensing obligations concerning 5G network coverage and

deployment, utilizing available enforcement tools, including sanctions for violations, as permitted under the Wireless Telegraph Ordinance [New Version], 1972, and the Communications (Telecommunications and Broadcasting) Law, 1982.

The Ministry of Communications should establish detailed minimum infrastructure deployment targets across all local authorities, ensuring that peripheral and Arab communities can access advanced infrastructure.

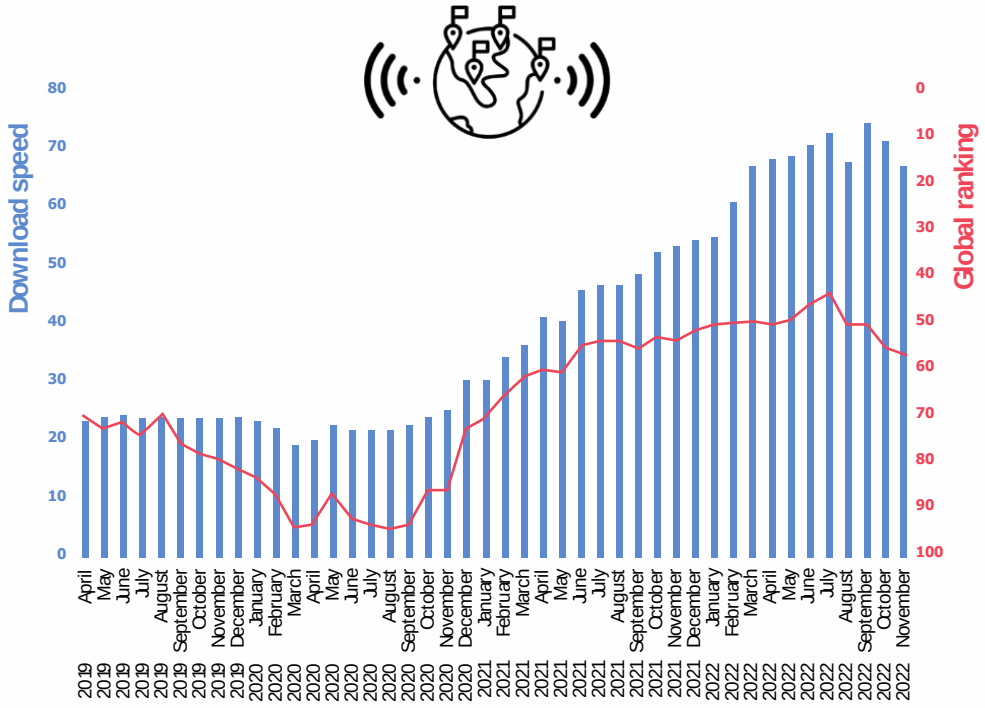
## Comparison of the Interviewee's Rate Reporting Moderate or Poor Cell Reception with Data from the Ministry of Communications Regarding the Rate of Cell Coverage in the Local Authority

| The Local Authority | Respondents rate who reported average or poor cell reception outside their home | Cell coverage rate according to the Ministry of Communications data |
|---|---|---|
| Rahat | 78% | 99.67% |
| Baqa al-Gharbiyye | 74% | 100% |
| Harish | 61% | 100% |
| Majd al-Krum | 59% | 100% |
| Beit Shemesh | 37% | 100% |
| Elad | 35% | 100% |
| Tiberias | 32% | 100% |
| Rosh Ha'ayin | 28% | 100% |
| Netivot | 27% | 100% |
| Ashkelon | 20% | 99.97% |
| Nahariya | 19% | 100% |
| Ashdod | 19% | 99.96% |
| Modi'in-Maccabim-Re'ut | 18% | 100% |
| Tel Aviv-Jaffa | 17% | 99.98% |
| Beer Sheva | 16% | 100% |
| Rishon Lezion | 16% | 100% |

| The Local Authority | Respondents rate who reported average or poor cell reception outside their home | Cell coverage rate according to the Ministry of Communications data |
|---|---|---|
| Haifa | 14% | 99.92% |
| Herzliya | 11% | 99.95% |

According to the findings of a survey conducted by the Office of the State Comptroller and according to data from the Ministry of Communications based on reports from cellular infrastructure companies processed by the Office of the State Comptroller.

## The Average Mobile Download Speed (in megabytes per second) and Israel's Rank Among 145 Countries, April 2019 to October 2022




According to data from the Ministry of Communications, processed by the Office of the State Comptroller.

# Summary

Cellular communication infrastructures are essential for maintaining a normal lifestyle and developing the Israeli economy. Implementing advanced cellular infrastructures promotes initiatives in various sectors, including health, transportation, and agriculture, resulting in substantial economic benefits. The Ministry of Communications has authorized cellular infrastructure companies to utilize radio frequencies, a finite state resource, to ensure adequate cellular services for the public, particularly in response to the growing demand for these services.

According to the Ministry of Communications' data, data consumption in Israel through cellular networks increased 28-fold from 2013 to 2022, at an exponential rate of 40% annually. An expected 43-fold increase in data consumption is anticipated by 2030, driven by the development of new cellular infrastructure applications. As of August 2023, Israel ranks 64th among 145 countries in the median surfing speed index. This audit report highlights significant challenges in cell reception quality in numerous local authorities throughout Israel. It identifies deficiencies within the governmental bodies responsible for ensuring efficient and secure cellular service for the public. Much of the audit's findings pertains to the Ministry of Communications' regulatory role in the industry. It was determined that the Ministry did not fully exercise its authority to gather information from cellular companies regarding public service delivery; instead, it relied on the companies' projections, which do not accurately reflect actual service levels. Moreover, the Ministry has not established supervision methodologies to assess the extent of compliance by cellular infrastructure companies with their obligations, nor does it possess sufficient information to ascertain whether and how well the companies are meeting their service coverage and quality requirements as stipulated in their licenses.

Furthermore, the State Comptroller's Office survey raised notable discrepancies between the Ministry of Communications data and the reports from local authorities and survey participants regarding the quality of cell reception. In the 18 local authorities surveyed, 11% to 78% of respondents experienced moderate or poor cell reception. Conversely, the Ministry of Communications reported coverage rates in these local authorities ranging from 99.92% to 100%, indicating full or nearly complete coverage. These findings raise concerns that the cellular infrastructure companies may not meet their licenses' coverage and reception standards.

The audit underscores the significant difficulties in cell reception within the examined local authorities stemming from a lack of broadcasting installations. The Ministry of Communications has not evaluated the needed number of installations and thus lacks data on the extent of absent broadcasting capabilities. An analysis of the deployment and operational status of 5G installations indicates that, as of July 2023, the deployment of 5G technology broadcasting installations did not align with the requirements outlined in the Ministry of Communications licenses. Moreover, Israel's coverage rate for this technology appears to be

inferior to the coverage rates that existed a year earlier among most European Union countries, despite 1,943 active 5G technology broadcasting installations in Israel as of July 2023. The audit also raised considerable disparities in deploying 5G technology communication infrastructures between central and peripheral local authorities, with the most severe coverage gaps observed in peripheral Arab ones. Although the Ministry of Communications has pursued legislative amendments to enhance the planning and licensing processes for cellular infrastructure in Israel, these processes have not improved.

Additionally, the report raised deficiencies in public protection against radiation from cellular broadcasting installations. The monitoring measures implemented by the Ministry of Environmental Protection, designed to assess actual radiation levels from these installations, primarily rely on data provided by the cellular infrastructure companies. Furthermore, no regulations have been enacted to define maximum exposure levels mandated by law. Instead, the Ministry of Environmental Protection has set permitted exposure levels without consulting the Ministry of Health, as the Ministry of Health does not address the health effects of non-ionizing radiation.

The Ministry of Health, responsible for public health, has not compiled professional information on the effects of non-ionizing radiation on public health, resulting in a lack of resources following the closure of a government-established knowledge center. Although the Ministry of Health acknowledges the insufficiency of the information available on the implications of radiation from 5G technology broadcasting installations on public health, which complicates the assessment of health risks associated with such exposure, it did not participate in the decision-making processes related to health risks associated with the deployment of cellular communication infrastructures.

Government transparency in presenting data from various ministries to the public could empower residents to make informed choices regarding cellular phone usage. While some states disclose information about cellular coverage through projections and measurement results via maps, notable deficiencies exist in the publication of data regarding the extent of cellular coverage and service quality and findings from radiation assessments of cellular broadcasting installations. Additionally, a lack of a standardized public information format regarding the effects of radiation from these installations on public health has been identified. This information is crucial for providing the public with reliable insights and addressing concerns, thereby facilitating the expansion of cellular infrastructure necessary to ensure high-quality service.

It is recommended that the government ministries, led by the Ministry of Communications, the Ministry of Health, and the Ministry of Environmental Protection, along with their respective ministers, address all deficiencies raised in the report. Rectifying these deficiencies may improve the quality of cellular services offered to the public in Israel while ensuring the protection of public health.