



Final Decision on
**Bottleneck Fiber Optic
Communications
Facilities**

09 May 2022

BACKGROUND

- 1 This document sets out the TRA’s final decision on whether to declare fiber optic facilities in FSM as bottleneck facilities and the reasoning for that decision. Appendix 1, titled “Final Determination,” sets out the TRA’s final determination based on the reasoning in this final decision.
- 2 The objectives of the Telecommunications Act of 2014 (the Act) include “*providing conditions for effective competition among service providers in the Federated States of Micronesia and encouraging efficient and sustainable investment in and use of communications networks and services*”¹ and “*providing efficient use of communications facilities and providing for cost-based interconnection and access on an equitable and non-discriminatory basis for operators of communications networks...*”²
- 3 Among other measures to achieve these objectives, the Act requires licensees to provide access to their “*bottleneck facilities*” to other licensees for the purposes of providing communications services.³
- 4 The Act gives us the power to declare communications facilities to be “*bottleneck facilities*” for the purposes of the Act.
- 5 We are now determining whether this list should be amended by declaring certain submarine and terrestrial fiber optic communications facilities to be “*bottleneck facilities*” and by adding them to the list in Schedule 1 of the Interconnection and Access Rules, 2019 (the Access Rules).
- 6 This decision is separate from any subsequent decisions, if any, that TRA may need to make on the terms or interim prices of access to bottleneck facilities under Sections 340 or 341 of the Act.

Fiber Optic Communications Facilities

- 7 Submarine and terrestrial fiber optic networks have been built or are being planned in all States of the FSM.
- 8 Submarine fiber cables connect overseas locations with cable landing stations (CLS) in the FSM. Submarine cables currently land in Yap, Chuuk and Pohnpei,⁴ and one is planned for Kosrae in the near future.
- 9 Terrestrial fiber networks connect those cable landing stations to the central offices or exchanges of a telecommunications licensee and, from there, to Optical Network Terminals (ONTs) in individual homes and businesses via a core fiber distribution

¹ Section 303(1)(c) of the Act.

² Section 303(1)(e) of the Act.

³ Section 339(1)(g) of the Act.

⁴ The Yap Spur on the SEA-US Cable, the Chuuk-Pohnpei Cable, and the Pohnpei Spur on the HANTRU-1 Cable System.

network along streets and roads⁵ and via drop cables connecting that core distribution network to individual premises.

- 10 Terrestrial fiber networks have been built on Weno and parts of Pohnpei, are being built in Yap, and are planned elsewhere in the FSM.

Bottleneck Facilities

- 11 The Act defines a “*bottleneck facility*” to be “*a communications facility declared by the Authority to be essential for the production of communications services which, for technical reasons or due to economies of scope and scale and the presence of sunk costs, cannot practicably be duplicated by a potential competitor in a communications market.*”⁶

- 12 The Act defines a “*communications facility*” to be “*any infrastructure, building, or switching equipment; any submarine cable landing in the Federated States of Micronesia, submarine cable landing station, or satellite transmitting facility; any location, mast site, tower, pole, trunk line, access line, duct or other underground facility; or other passive equipment that is used or is capable of being used for communications or for any operation directly connected with communications, but excluding customer equipment.*”⁷ (emphasis added)

- 13 In order for a communications facility to be considered a “*bottleneck facility*,” it must satisfy the definition in the Act, and we must make a declaration to that effect.

Consequences of a Declaration of Bottleneck Facility

- 14 Licensees who own or control bottleneck facilities are subject to various obligations in the Act and the Access Rules. These include, in particular, the obligations:

- in Section 339(g) of the Act, to provide “*access to communications facilities, networks, software and services, in a manner that is sufficiently unbundled, including co-location, to enable the second licensee to access the facilities and wholesale services that it reasonably requires in order to provide communications services to its customers;*”
- in Section 39(1) of the Access Rules, to “*agree to, and take all reasonable steps required to give effect to, reasonable requests for Access to and use of, Bottleneck Facilities it owns or Controls;*” and
- in Sections 39(2) and 42 of the Access Rules, to refuse to grant access to bottleneck facilities the licensee owns or controls only “*on grounds of technical, economic, or legal infeasibility.*”

- 15 Licensees who own or control bottleneck facilities are also subject to Section 343(2)(g) of the Act, which considers “*designing or installing a communications facility or a*

⁵ FSMTC described this “core” network in a February 2020 RFP as consisting of “primary” and “secondary” fiber. The FSM Telecommunications Cable Corporation (**the OAE**) described it in documentation available on its website (<https://fsmcable.com>) as the “communal network.”

⁶ Section 302(f) of the Act

⁷ Section 302(h) of the Act

communications network with the purpose of preventing or hindering another licensee from acquiring interconnection or access” to be anti-competitive conduct.

- 16 A declaration that a facility is a bottleneck facility does not change or affect the ownership or control of that facility. Such a declaration gives other licensees the right to request access to the facility and gives the licensee who owns or controls it the obligation to negotiate terms of access consistent with the Act and the Access Rules.
- 17 For the avoidance of any doubt, in this determination process the TRA is exercising the functions and powers given to it by the Act in order to achieve the objectives of the Act. These functions and powers include the power to declare facilities to be bottlenecks in order to promote competition. They do not include the power to either expropriate facilities, or to force the owner of the facilities to provide services at prices below reasonable cost.
- 18 If submarine or terrestrial fiber networks do not satisfy the definition of “*bottleneck facilities*” under the Act, or if they do and we do not declare them to be “*bottleneck facilities*” under the Act, licensees who own or control them would not be required to provide access to them to other licensees. Further, we would not have the power under Section 340 of the Act to determine disputes between licensees on the terms of access to submarine or terrestrial fiber networks.
- 19 To the extent that they are essential for the production of communications services, a potential competitor could either be excluded from the market or could be forced to make an inefficient and unsustainable investment in duplicate facilities to produce those communications services, contrary to the objectives of the Act. This could prevent the development of effective competition in the FSM, contrary to the objectives of the Act, and could give licensees who own those facilities significant market power.

Consultation process

- 20 The TRA has provided ample opportunities for interested parties to provide their views throughout the determination process. The consultation process is summarised below. At various stages in the process, parties that made written or oral submissions to TRA included: FSM Telecommunications Corporation (FSMTC), FSM Telecommunications Cable Corporation (referred to as the Open Access Entity or OAE), Kacific, iBoom, the Department of Transportation, Communications, & Infrastructure (DTC&I), Chuuk State, and the Chuuk Public Utility Corporation (CPUC).
- 21 The TRA published a consultation paper on 1 June 2021 to gather and consider stakeholders’ views before deciding whether to declare fiber optic communications facilities to be bottleneck facilities and, if so, the scope of that declaration.
- 22 Written responses to the consultation paper were received from the following parties, and are provided on the TRA’s website:⁸
 - Chuuk State

⁸ TRA, “Comments Received Bottleneck Facilities Consultation: 1 June – 25 June 2021”, available at: <https://tra.fm/wp-content/uploads/2021/07/Comments-Received-Bottleneck-Facilities-.pdf>

- CPUC
 - DTC&I
 - FSMTC
 - iBoom
 - OAE.
- 23 The TRA held a subsequent stakeholder conference on 14 July 2021 (first conference), listened to views expressed, and took these into account.
- 24 The TRA issued on 20 August 2021 a letter summarising the views expressed by stakeholders at the first conference, along with TRA's request for additional information. A copy of a sample letter is attached as Appendix 2.
- 25 The TRA issued a further information request on 27 September 2021 (attached as Appendix 4).
- 26 Responses to the 20 August letter were received from the following parties:
- CPUC
 - FSMTC
 - Kacific
 - OAE.
- 27 Responses to the 27 September letter were received from the following parties:
- Kacific
 - FSMTC
 - iBoom.
- 28 All parties were given reminders and additional time to provide responses to TRA's information requests and any additional relevant information.
- 29 While FSMTC and iBoom responded to the 27 September letter, the responses did not provide specific answers to TRA's questions.
- 30 Written views provided by interested parties in response to the 20 August letter are summarized in Appendix 4 of the Draft Decision Consultation paper.
- 31 On 22 December 2021 the TRA issued the Consultation Paper for the Draft Decision on Bottleneck Fibre Optic Communication Facilities (the Draft Decision Consultation Paper), a list of facilities and the Notice of Consultation. In the accompanying email the TRA also invited parties to provide written comments by no later than 5:00pm 4 February 2022.

- 32 Responses to the 22 December Draft Decision Consultation paper were received from the following parties:
- FSMTC
 - OAE
 - iBoom.
- 33 Written views provided by interested parties in response to the 22 December Draft Decision Consultation paper are summarized in Appendix 6.
- 34 The TRA held a subsequent stakeholder conference on 2 March 2022 (second conference), listened to views expressed additional to the written comments received, and took these into account.
- 35 Responses heard by the TRA during the second conference are summarized in Appendix 7.
- 36 Following the second conference, the TRA issued on 2 March 2022 an invitation for interested parties to provide cross submissions on the comments presented to date by no later than 5:00pm 18 March 2022 (attached as Appendix 8).
- 37 Responses to the cross-submission invitation were received only from FSMTC.
- 38 FSMTC's cross-submission in response to the 2 March invitation is summarized in Appendix 9.

ANALYTICAL FRAMEWORK

- 39 In arriving at its analytical framework, the TRA follows the Act and has taken into account:
- written and oral submissions and comments made by parties on the framework the TRA should adopt, and
 - where consistent with the application of the Act, academic literature on the "essential facilities doctrine" from the US, which has clear parallels to the regulatory framework in FSM.⁹
- 40 In summary, in historical antitrust cases, US courts have generally held a facility to be essential if it meets at least one of the following characteristics:
- The facility is essential to the public at large receiving a vital good or service.

⁹ Seelen, Christopher M. "The Essential Facilities Doctrine: What does it mean to be essential?" *Marquette Law Review*, Vol 80, Issue 4, 1997, available at: <https://core.ac.uk/download/pdf/148688457.pdf>

- The facility is essential to competition for the service. That is, controlling the facility allows the controlling party to improperly interfere with competition in the relevant markets downstream of the facility. This happens when the facility cannot be practicably duplicated by competitors.
- 41 Other US cases argued on the basis of a third characteristic—that the facility is essential because of consumer preferences to use the facility over potential substitutes—have at times been successful, but less consistently so.
- 42 The FSM regulatory framework is broadly consistent with the two key characteristics from US antitrust case law:
- The Act essentially reflects the concept of communications services being essential to the public, by specifically targeting facilities that are “essential for the production of communications services” for potential access regulation as bottleneck facilities;
 - The Act also reflects the concept of “essentiality to competition” by targeting facilities that “cannot practicably be duplicated by a potential competitor in a communications market”.
- 43 TRA proposes that the question of whether a communications facility is a bottleneck facility should be addressed using the methodology described below and summarized in Appendix 5.
- 44 To determine whether a facility should be declared a bottleneck facility, the TRA has applied the following three steps. At each step, TRA considers a key question based on the available evidence:
1. **Define the reference facility by asking:** What is the reference facility and the characteristics of the services that can be produced using it, and the markets in which those services are provided?
 2. **Consider whether the facility is essential for the production of communications services by asking:** Are there, or likely to be, alternative facilities in a market in the FSM which can produce the same or similar services (providing customers with similar services at a similar cost)?
 3. If the answer to the previous question is “no,” consider **whether the reference facility can practicably be duplicated?**
- 45 The last two questions correspond to the two branches of the definition of bottleneck facilities in the Act, paraphrased below:
- “bottleneck facility” means a communications facility declared by the Authority*
1. *to be essential for the production of communications services*
 2. *which, for technical reasons or due to economies of scope and scale and the presence of sunk costs, cannot practicably be duplicated*
- by a potential competitor in a communications market.*
- Rationale for this methodology**
- 46 The first question focuses on functionality that licensees can use when accessing the reference facility. The TRA has statutory objectives of promoting the long-term interests of users and of providing conditions for effective competition. Users consume

communications services (which are enabled by the functionality of the relevant facility), and competition between licensees is on the basis of services. In other words, facilities are not ends in themselves—they are used to produce communications services.

- 47 These services are then provided to consumers in specific markets in the FSM, in competition with services produced by other service providers using the same types or different types of facilities in the FSM. In other words, any assessment of possible bottleneck facilities must start with describing the functionality provided by the facilities.
- 48 Once the services and their characteristics and markets are identified, one can proceed to address the two branches of the definition of bottleneck facility in the Act.
- 49 The second question focuses on alternatives to the reference facility. In assessing whether a facility is an alternative to another, it is necessary to consider it in the FSM context, in particular, the state of development of the market and the likelihood of the alternative facility being built if the reference facility exists. This is not a purely technological analysis focusing solely on the technical characteristics of the reference and alternative facilities. A facility that might be essential in one jurisdiction might not be elsewhere.
- 50 The analysis under the second question is not static. It is important to consider alternative facilities that are reasonably likely to exist within the near future, (but not speculative hypothetical facilities). It is also important to consider the likelihood of the alternative facility being deployed in the FSM if the reference facility were to be built.
- 51 If a potential competitor is not likely to deploy the alternative facility in the FSM to produce competitive services if the reference facility were already in place, then it likely should not be considered a true alternative. If such facilities do not exist already, they are only likely to be built if the owner of these alternative facilities can reasonably expect to earn sufficient returns to sustainably operate a business.
- 52 Non-commercial investments in alternative facilities funded by grants from government or multilateral organisations are also theoretically possible. However, they are unlikely, as grant funding is usually focused on supporting service provision where no equivalent service currently exists.
- 53 The third question focuses on duplication of the reference facility. Specifically on the technical or economic barriers that might exist that would act to prevent a potential competitor from deploying the same type of facility in order to produce competitive services.
- 54 As with alternative facilities, duplicate facilities are only likely to be built if the owner of these alternative facilities can reasonably expect to earn sufficient returns to sustainably operate a business. Further, non-commercial investments in duplicate facilities funded by grants from government or multilateral organisations are also unlikely, as grant funding is usually focused on supporting service provision where no equivalent service currently exists.
- 55 As before, in assessing whether a facility can practicably be duplicated, it is necessary to consider it in the FSM context.

REFERENCE FACILITIES

What is the reference facility and the characteristics of the services that can be produced using it, and the markets in which those services are provided?

- 56 The first stage of the analysis focuses on the characteristics of what facilities are being considered as potential bottleneck facilities.
- 57 In this case, we are considering two types of facilities:
- Submarine fiber optic communications facilities
 - Terrestrial fiber optic communications facilities.
- 58 Both types can be used to produce a variety of communications services that are key to the development of the economy and society of the FSM.

Submarine Facilities

Description

- 59 A submarine fiber optic communications facility is a cable laid across the foreshore and under the sea containing one or more pairs of fiber strands connecting a location within the FSM to a location outside the FSM, or connecting islands within FSM to each other.
- 60 The Chuuk-Pohnpei Cable connects two cable landing stations in the FSM (on Weno and Pohnpei, respectively). The Yap Spur and the Pohnpei Spur consist of two components. The first component is a length of submarine cable owned by an FSM licensee (the OAE and FSMTC, respectively) which runs from a cable landing station in the FSM to a branching unit on another submarine cable on the seabed (the SEA-US and HANTRU-1 cables, respectively). The second component is an Indefeasible Right of Use (IRU) on that other submarine cable which enables a connection and the transfer of traffic from the branching unit to a termination point in a landing station in Guam.^{10 11} Without the IRUs, international connectivity via the Yap Spur and the Pohnpei Spur would not be possible and the IRUs are integral parts of the Yap Spur and the Pohnpei Spur.
- 61 Submarine fiber optic cables are used for high-capacity access to the global internet.

Product market enabled by the facilities

- 62 The submarine facilities enable a telecommunications operator to provide its customers with data and internet services, and international and inter-state calling services.
- 63 Any operator looking to provide data and internet services or national and international calling services in FSM would need to use the submarine facilities or other facilities that can provide an equivalent service.

¹⁰ FSMTC Annual report for 2019 and 2020, page 23, available at: [http://www.fsmopa.fm/files/FY2021/FSMTC_fs20%20\[Final%20Feb%2016%202021\].pdf](http://www.fsmopa.fm/files/FY2021/FSMTC_fs20%20[Final%20Feb%2016%202021].pdf)

¹¹ OAE Annual report for 2018 and 2019, page 7, available at: [http://www.fsmopa.fm/files/FY%202020/FSMTCC_fs19%20\[FINAL%2003.16.21\].pdf](http://www.fsmopa.fm/files/FY%202020/FSMTCC_fs19%20[FINAL%2003.16.21].pdf)

Geographic market enabled by the facilities

- 64 In TRA’s view, the relevant geographic markets enabled by submarine facilities are four separate markets—one for each State in the FSM. Each cable serves one State.
- 65 Services enabled by the cable in one State do not substitute for services provided in another State. Given the large distance between the main population centres of the FSM States, it is not practicable for a telecommunications operator to use the submarine facilities in one State to enable communications services in another state. The operator would still need a way to move data between the two relevant States.
- 66 In the TRA’s view, two cables connecting to one State, and providing connectivity for that State, generally do not create two markets, but rather two facilities that serve the same market.
- 67 The OAE argued that, while each state is a separate geographic market, it may be that some states (such as Chuuk) consist of more than one geographic market, at least for submarine cables. For example, a separate cable connected to the Mortlock Islands, or to the northern or western outer islands of Chuuk would likely be serving a different market to the Chuuk lagoon cable that lands in Weno.
- 68 The TRA considers that, in such an instance, as noted in paragraph 111 of the Draft Decision, the TRA would repeat the assessment of whether a new submarine fiber optic facility is a bottleneck facility, including the definition of the relevant geographic market, as and when such a new submarine fiber optic facility is built.

Terrestrial Facilities

Description

- 69 A terrestrial fiber optic communications facility is a cable containing several pairs of fiber strands, starting from a central location (a CLS or telecommunications central office) and running to one or more customer premises.
- 70 It can be configured in different ways, depending upon the intended service. For example:
- In a point-to-point configuration providing a dedicated connection between two locations to serve individual customers or to provide backhaul services for a communications network, with no cost-effective or practical way to add multiple new connection points to that existing facility, or
 - In a broader Fiber to the Premise¹² (FTTP) network configuration that passes by a large number of premises (houses and businesses) in a neighborhood, using a point-to-multipoint architecture which is designed to allow multiple new connections to be added to that existing facility readily and cost effectively in the future.

¹² In literature, the terms Fiber to the Home (FTTH) and Fiber to the Premise (FTTP) are often used interchangeably. The TRA uses FTTP to make it clear that the connections on the fiber network will be not only homes, but also other premises, like for example businesses and government offices.

71 In an FTTP configuration, the premises can then be connected to the FTTP network by installing drop wires.

72 Through the strategic placement of splitters, an FTTP network might also be able to support solutions requiring the point-to-point configuration (refer OAE November 2020 document: “centralized” vs “cascaded” architecture).¹³

Product market enabled by the facilities

73 Terrestrial fiber optic cables enable the operator to provide:

- End users with high-speed access to the Internet and local voice calls, provided that the terrestrial fiber facilities are connected to a submarine cable facility or some suitable alternative that provides inter-island and international connectivity
- Commercial customers (potentially including other telecommunications licensees) with high capacity backhaul data connectivity services to connect elements of those customers’ own networks.

74 When providing a voice call service over terrestrial fiber facilities, modern phone networks use Voice over Internet Protocol (VoIP) at least for backhaul of voice calls and handle voice calls as a form of Internet protocol data traffic. In that sense, pure end-to-end voice calling facilities are no longer being created, though legacy analogue systems remain in use in some countries including FSM.

75 Therefore, the TRA considers that the relevant product market can be defined as providing internet access and backhaul connectivity, but does not include pure end-to-end voice services.

Geographic market enabled by the facilities

76 The relevant geographic markets are areas covered by a contiguous FTTP network. This is typically a single island, or a group of islands lying in sufficiently close proximity to each other to enable connection to the same network.

77 Services provided using terrestrial fiber are inherently local in nature, as services provided on one island or group of islands do not substitute for services provided on another island or group of islands.

ALTERNATIVE FACILITIES

Are there, or likely to be, alternative facilities in a market in the FSM which can produce the same or similar (i.e. competitive) services?

78 The focus of this second stage in the analysis is on facilities other than the reference facility that can provide the same or similar functionality as the reference facility, which can be used to provide services that are competitive with the services produced using the functionality of the reference facility in the FSM.

¹³ OAE, “FSM Wholesale Connectivity – Introduction for Potential Service Providers”, at page 7. Available at <https://fsmcable.com/wp-content/uploads/2020/11/High-level-OAE-overview-for-RSP-2020.pdf>

Submarine Facilities

- 79 At the first conference, and in its cross-submission after the second conference, FSMTC argued that satellite facilities are a potential alternative to submarine (and terrestrial) fiber optic facilities to produce the services listed in the previous section.
- 80 As noted earlier in this paper, submarine fiber optic cables are used for high-capacity access to the global internet. To put “high capacity” in perspective, the submarine cables that form the HANTRU-1 and SEA-US systems (which FSM is connected to) provide capacity of up to 160 Gbps.
- 81 By comparison, the Kacific satellite links over FSM currently provide capacity of between [c-i-c █████] ¹⁴ (over Pohnpei and Kosrae) and [c-i-c █████] gbps (over Chuuk). Kacific does not offer services to Yap, though it may do in the future. Starlink may also introduce a satellite service to end users in the FSM, but there is yet no indication of when or whether Starlink may seek to offer services in the FSM.
- 82 Other satellite providers do offer a backhaul satellite service to licensees in FSM. Between 2015 and 2018, total satellite facility capacity over the Pacific Ocean increased from 1.3 to 3.1 Gbps. ¹⁵
- 83 Therefore, submarine facilities typically have a capacity that is at least 20 times the capacity currently available over satellite.
- 84 Satellite facilities also provide inferior service with more latency ¹⁶ and jitter ¹⁷ than submarine fiber facilities. As a result, the characteristics of the downstream services that can be provided over the two types of facilities are also markedly different. The table below compares the typical end user services (fiber and 4G) that can be provided with the support of international backhaul submarine services, to the satellite services currently being provided by Kacific that use satellite backhaul instead of using submarine fiber facilities.

TABLE 1: CHARACTERISTICS OF DOWNSTREAM SERVICES

	Fiber (Typical)	4G (Typical)	5G (Typical)	Satellite (Kacific)
Speed down	~1000 Mbps	~20 Mbps	100-200 Mbps	3-30 Mbps
Speed up	~880 Mbps	~5 Mbps	12-20 Mbps	3-10 Mbps
Latency	10-20ms	36-55ms	29ms	550-600ms
Jitter	0.5-2ms	4.4-47ms	5-35ms	48.7ms

Sources:

Fibre (speed) - <https://www.business.org/services/internet/dsl-vs-cable-vs-fiber-vs-satellite/>

Fibre (latency) - https://www.ofcom.org.uk/data/assets/pdf_file/0027/113796/home-broadband-2017.pdf

Fibre (jitter) - https://www.ofcom.org.uk/data/assets/pdf_file/0027/113796/home-broadband-2017.pdf

- ¹⁴ Commercial in confidence, or c-i-c, refers to confidential business information disclosed to TRA for a specific purpose. In the public Final Decision and Determination this information will be redacted and represented with blacked out blocks of text.
- ¹⁵ Inmarsat (2017), “Working Group on Technologies in Space and the Upper-Atmosphere – Identifying the potential of new communications technologies for sustainable development”, figure 3, p.20, available at: <https://www.intelsat.com/wp-content/uploads/2020/08/Intelsat-Technologies-in-Space-Report.pdf>
- ¹⁶ Latency is the time it takes for data to be transferred between its original source and its destination, i.e. the reaction speed of an internet connection.
- ¹⁷ Jitter is the fluctuation or variation of latency over time.

4G (speed) - <https://www.4g.co.uk/how-fast-is-4g/>
 4G (latency) - <https://5g.co.uk/guides/4g-versus-5g-what-will-the-next-generation-bring/>
 4G (jitter) - <https://www.tutela.com/blog/colombia-tigo-delivers-best-speeds-but-suffers-from-4g-jitter>, <https://rootmetrics.com/en-US/content/us-LA-gaming-report-2020>
 5G (speed & latency) - <https://5g.co.uk/guides/how-fast-is-5g/>
 5G (upload speed) - <https://www.4g.co.uk/how-fast-is-4g/>
 5G (jitter) - https://downloads.ctfassets.net/ob7bbcsqy5m2/4xleqsGvxfw4fejLt2ChdV/e07972594acb5f9f86b4cfac322d4cee/RootMetrics_Gaming_Report_Final.pdf
 Kacific (speed & latency) - <https://kacific.com>
 Satellite (jitter) - <https://broadbandnow.com/HughesNet-speed-test>

- 85 As the table above shows, the latency and jitter are orders of magnitude worse for satellite facilities.
- 86 Finally, satellite services are significantly more expensive per unit of capacity. This is why FSMTC only purchases a relatively small amount of satellite backhaul capacity as backup in the event that the fiber optic submarine cable fails. For example, when the HANTRU-1 cable required repairs in 2017, FSMTC had only 197 Mbps of satellite capacity in place as backup and was only able to secure an extra 130 Mbps once the repairs began.¹⁸ Thus, at its peak in 2017, FSMTC had only 0.3 Gbps of satellite back up capacity available.

- 87 **Final decision on submarine fiber optic cables providing internet services:** Where a submarine fiber optic facility exists, there are no alternative facilities that can produce the same or similar (i.e. competitive) services. TRA must therefore consider whether submarine fiber optic facilities can be practicably duplicated by a competitor.

Terrestrial facilities

- 88 Where terrestrial fiber facilities exist in a geographic market (an island, or group of islands), telecommunications services can also be achieved by sending data over copper wires (twisted pair and DSL), mobile networks (4G or 5G) or satellites. The key consideration is whether the resulting service is sufficiently similar to:

- Internet services provided to households and businesses over an FTTP network
- Point-to-point backhaul services over fiber to connect large commercial customers' own communications equipment.

FTTP facilities providing internet services

- 89 Internet access services produced using copper wires offer much lower speeds than what can be achieved with fiber, modern mobile networks, or even modern satellite communications. Copper facilities are therefore not sufficiently similar alternatives.
- 90 Internet access services provided using mobile communications and satellites are inferior (see earlier Table 1) and more expensive.

¹⁸ Jaynes, B., "Fiber optic repair means slow internet in Pohnpei but almost no Internet services in RMI", *The Kaselehlie Press*, available at: http://www.kpress.info/index.php/index.php?option=com_content&view=article&id=504:fiber-optic-repair-means-slow-internet-in-pohnpei-but-almost-no-internet-services-in-rmi&catid=8:news&Itemid=103

- 91 Compare the expected retail costs of \$30-35 per month for fiber access with unlimited usage relying on OAE's wholesale services against:
- \$150+ per month for Kacific's unlimited satellite services offering inferior speeds, latency and jitter
 - FSMTC's best 4G offering of \$10 per 12GB of usage with inferior speeds, latency and jitter. Purchasing 300GB of usage (which is equivalent to the usage provided under the most basic fiber plan in Fiji)¹⁹ on FSMTC's 4G would cost \$250
 - The fact that any 5G services rolled out in FSM would likely be at prices similar to current 4G tariffs. While speeds would increase, they would still be inferior to fiber.
- 92 While mobile and satellite have broader reach than fiber—by their nature covering a broader area more effectively—the service quality is inferior and the cost to consumers is materially higher.
- 93 Satellite and mobile internet services can thus serve as a useful complement to FTTP internet services. For example, recent literature also confirms that substitution between mobile and fiber services is focused mainly on social media and music streaming use cases, with very limited substitution when it comes to other internet access use cases.²⁰
- 94 **Final decision on FTTP facilities providing internet services:** Internet access services provided using copper, mobile or satellite communications facilities are not an effective substitute for similar services produced using FTTP facilities. Copper, mobile and satellite facilities are therefore not alternatives to FTTP facilities, and the TRA must consider whether terrestrial FTTP facilities can be practicably duplicated.
- Terrestrial fiber facilities providing point-to-point backhaul services*
- 95 For the same reasons as discussed for FTTP (significantly lower capacity and quality, and significantly higher costs), backhaul services produced using point-to-point satellite or mobile communications facilities are not effective product substitutes for backhaul services produced using fiber optic facilities.
- 96 This is because backhaul use cases generally require more capacity, higher speeds and lower latency and jitter than standard household internet usage.
- 97 In the specific use case where the backhaul service is to be provided between two points that have line of sight, point-to-point microwave facilities can provide comparable levels of service. The costs can also be similar or even lower, depending on distance, especially when connecting two sites separated by a body of water (like islands in close proximity). The TRA has already declared "towers and other supporting constructions for the provisions of radio communications services" to be bottleneck facilities, which

¹⁹ Telecom Fiji, "Fibre – The future of broadband", <https://www.telecom.com.fj/your-home/your-home-broadband/fibre-residential-packages/> (accessed December 21, 2021)

²⁰ Quaglione, D. Matteucci, N. Furia, D. Marra, A & Pozzi, C. "Are mobile and fixed line broadband substitutes or complements? New empirical evidence from Italy and implications for the digital divide policies" *Socio-Economic Planning Sciences*, Vol 71, Sep 2020, available at: <https://www.sciencedirect.com/science/article/abs/pii/S0038012119301016>

will further facilitate the use of microwave facilities as an alternative, where suitable towers already exist.

- 98 **Final decision on terrestrial fiber facilities providing point-to-point backhaul services:** Point-to-point backhaul services provided using mobile or satellite communications facilities are not an effective substitute for similar services produced using fiber facilities. Mobile or satellite facilities are therefore not alternatives for point-to-point terrestrial fiber facilities.
- 99 In the specific case where direct line of sight exists between the two points to be connected, a microwave link might provide an effective alternative to a terrestrial fiber link. Such a case is likely to be fairly common in FSM, and so a blanket declaration of all point-to-point facilities as bottleneck facilities is not warranted.
- 100 However, a microwave link might not be feasible in all cases, in particular where a direct line of sight does not exist. The TRA must therefore consider whether terrestrial fiber facilities providing point-to-point backhaul services can be duplicated where a microwave link is not feasible.

DUPLICATING THE REFERENCE FACILITIES

Submarine Facilities

Stakeholder views

- 101 The stakeholder consensus suggests it is not practicable to duplicate submarine fiber optic facilities with other submarine fiber optic facilities.
- 102 FSMTC believe that cost is the driving factor of whether duplication is practical rather than possible.²¹ During the first conference, FSMTC stated “the investment cost of putting in submarine cable is quite high, it is very prohibitive for anyone especially in this small market”²² and “FSMTC has no interest duplicating cables to Chuuk and Yap unless they get a grant to provide a backup service.”²³
- 103 In feedback to the TRA on bottleneck facilities, OAE, CPUC and iBoom agree that it is not practical to duplicate submarine cables as they cannot be economically replicated while also keeping prices low for customers. OAE and CPUC make the point that duplicating networks results in twice the fixed costs needing to be shared over the same number of customers. iBoom also believe that it is a good long-term goal to have a secondary redundant backup, but there is no point achieving that “when the first submarine cable isn’t being used fairly.”²⁴

²¹ TRA Bottleneck Facilities First Public Conference 14 July 2021 – 01:45:25 in accessed recording

²² TRA First Public Conference – 01:42:46 in accessed recording

²³ TRA First Public Conference – 01:44:20 in accessed recording

²⁴ TRA, “Comments Received Bottleneck Facilities Consultation: 1 June – 25 June 2021”, available at: <https://tra.fm/wp-content/uploads/2021/07/Comments-Received-Bottleneck-Facilities-.pdf>

- 104 At the second conference, both CPUC and OAE noted that they supported the TRA’s draft determination that it is not practicable to duplicate any of the submarine fiber optic cable facilities in FSM.

Other evidence

- 105 In each of the markets (States) where subsea cables exist or are planned in the near future, the capital costs are high and donor funding or financing was required to make the projects viable:

TABLE 2: COST AND DONOR SUPPORT FOR FSM SUBSEA CABLES

Cable	Cost (USD millions)	Donor support type	Donor
HANTRU-1 Pohnpei Spur	\$12	Concessional loan, 5% per annum	United States (US) Department of Agriculture Rural Utility Service ²⁵
Chuuk-Pohnpei	\$18.5	IDA Grant	World Bank ²⁶
SEA-US Yap Spur	\$22.5	IDA Grant	World Bank ²⁷
Kosrae to Pohnpei (planned)	\$14	Grant	US government ²⁸

- 106 The potential capacity on the HANTRU-1 Pohnpei spur is 160Gbps.²⁹ The International Telecommunication Union (ITU), last reported actual bandwidth usage in and out of FSM in 2017, providing a figure of 0.86Gbps,³⁰ while the Kaselehlie Press provided a figure of 1Gbps for 2016.³¹

²⁵ Jaynes, B., “Congress again debating bill to transfer ownership of Pohnpei spur of HANTRU-1 fiber optic line”, *The Kaselehlie Press*, available at: http://www.kpress.info/index.php?option=com_content&view=article&id=1679:congress-again-debating-bill-to-transfer-ownership-of-pohnpei-spur-of-hantru-1-fiber-optic-line&catid=8&Itemid=103

²⁶ The World Bank, “Pacific Regional Connectivity Program 2:FSM Connectivity Project (P130592) – Implementation Status and Results Report”, available at: <https://documents1.worldbank.org/curated/en/729791626768477497/pdf/Disclosable-Version-of-the-ISR-Pacific-Regional-Connectivity-Program-2-FSM-Connectivity-Project-P130592-Sequence-No-12.pdf>

²⁷ “Pacific Regional Connectivity Program 2:FSM Connectivity Project (P130592) – Implementation Status and Results Report”

²⁸ Barrett, J., “U.S. funding tapped for Pacific undersea cable after China rebuffed”, *Reuters*, accessed 10 December 2021 at: <https://www.reuters.com/world/asia-pacific/exclusive-us-funding-tapped-pacific-undersea-cable-after-china-rebuffed-2021-09-03/>

²⁹ Layer10 (2019), “Pacific-IX Desktop Feasibility Study”, p. 20, available at: https://www.unescap.org/sites/default/files/Pacific_IXP_ISOC_FINAL_0.pdf

³⁰ ITU, “International Bandwidth In Mbits 2007-2019”, available at: https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2020/InternationalBandwidthInMbits_2007-2019.xlsx

³¹ Jaynes, B., “Fiber optic repair means slow internet in Pohnpei but almost no Internet services in RMI”, *The Kaselehlie Press*, available at: http://www.kpress.info/index.php?option=com_content&view=article&id=504:fiber-optic-repair-means-slow-internet-in-pohnpei-but-almost-no-internet-services-in-rmi&catid=8:news&Itemid=103

107 OAE has reported “current network capacity is sufficient for years to come and does not require extra capital expenditures to meet demand.”³² This is supported by analysis from the World Bank which estimated FSM bandwidth requirements on HANTRU-1 in 2041. The estimates are provided in Table 3 below and show a wide safety margin between estimated traffic and potential capacity.

TABLE 3: CHARACTERISTICS OF DOWNSTREAM SERVICES (Gbps)

	Low scenario	Baseline scenario	High scenario
FSM (Chuuk, Pohnpei)	3.0	5.9	14.7
FSM (Kosrae)	0.5	0.9	1.8

Source: <https://documents1.worldbank.org/curated/pt/687711494852044530/text/FSM-Pacific-Req-Connectivity-PP-PAD2068-05112017.txt>

- 108 As at the end of 2017, according to the ITU, the international lit capacity of submarine cables connecting FSM was 4,000 Mbps, of which only 250 Mbps was committed.³³
- 109 Donor funding and financing support for the current cables reduces the costs of the services provided using the cables. A competitor building a new submarine facility to a State or island where one already lands today is not likely to get a return on their investment because the current and reasonably anticipated demand is already satisfied by existing cable capacity.
- 110 **Final decision:** the TRA considers it is not practicable to duplicate any of the submarine fiber optic cable facilities in FSM for reasons of economies of scope or scale and sunk costs. Subject to the discussion below, all submarine facilities will therefore be declared to be bottleneck facilities.
- 111 In its comments on the Draft Determination, iBoom queried what was meant by “*access to capacity to international termination in Guam*” in the first bullet of the Draft Determination in Appendix 5 of the 22 December Draft Consultation Paper. As described in paragraph 60 above, the Yap Spur and the Pohnpei Spur include IRUs in the SEA-US and HANTRU-1 submarine cables, respectively, for onward connectivity to Guam. The TRA considers that these two IRUs are integral parts of the submarine cable bottleneck facilities and that access must be provided to capacity in both components of a Spur in order that the licensee receiving access can obtain international connectivity from the FSM to Guam. The final Determination in Appendix 1 has been amended to clarify this and to address iBoom’s query.
- 112 The TRA considers that, because the Yap Spur and the Pohnpei Spur do not extend beyond a cable landing station in Guam, the declaration of bottleneck facilities does not

³² OAE Annual report for 2018 and 2019, available at: [http://www.fsmopa.fm/files/FY%202020/FSMTCC_fs19%20\[FINAL%2003.16.21\].pdf](http://www.fsmopa.fm/files/FY%202020/FSMTCC_fs19%20[FINAL%2003.16.21].pdf)

³³ ITU, “Maximising availability of international connectivity in the Pacific”, *ITUPublications*, available at: https://www.itu.int/en/ITU-D/Regulatory-Market/Documents/Infrastructure_portal/Maximising-availability-of-int-connectivity-in-the-pacific.pdf

apply to any other arrangements in Guam that a licensee may need (such as cross-connectivity between the two Spurs or a connection to the global Internet).

Pohnpei Spur

- 113 FSMTC and OAE submitted that the Pohnpei Spur is effectively two facilities because half of the 16 available wavelengths on the facility are allocated to each of FSMTC and OAE, who can operate and upgrade them independently, and their two halves of the Pohnpei Spur are therefore “duplicated” and should not be considered a bottleneck facility. FSMTC restated this position in its written response on the draft determination and its cross submission after the second conference.
- 114 FSMTC also argued in its cross submission that declaring the Pohnpei Spur to be a bottleneck facility would create an unnecessary resource burden on FSMTC.
- 115 The TRA notes the Pohnpei Spur is owned by FSMTC,³⁴ not by FMSTC and OAE (OAE has rights of use established by contract). Thus, even if the Pohnpei Spur were considered to be two facilities, FSMTC would be considered to own both facilities.
- 116 New channels were not created to be given to OAE when the contract was signed—the system started with 16 channels, and still has 16. What FSMTC has done is share that submarine facility with OAE by giving OAE access to 8 specific wavelengths.
- 117 The TRA’s view is that there is a single facility which has been shared by two parties via an agreement, under which one party (FSMTC) allows access by another party (OAE).
- 118 The fact that OAE secured rights in the existing facility instead of building a separate facility between Pohnpei and Guam also suggests the Pohnpei Spur cannot practicably be duplicated. The fact that two parties each use half of the facility will, however, be an important consideration in the future when assessing whether terms and conditions offered to third parties satisfy the requirements of the Act (particularly Section 339(g)), as third parties will have access to two suppliers of similar services on the Pohnpei Spur.
- 119 The TRA notes that the declaration of a bottleneck facility does not in and of itself impose a burden on the owner of the facility. Any burden that FSMTC refers to would only result if new entrants sought access to the Pohnpei Spur from FSMTC, rather than OAE. In any case, when deciding whether a facility is a bottleneck, the resulting administrative burden on the current owner of the facility is not a relevant consideration under the Act.
- 120 **Final decision:** Given the above, and consistent with our conclusion on submarine facilities generally, the TRA considers that the Pohnpei Spur, like other submarine cables in the FSM, is an essential facility (i.e. a facility that is essential for the production of communications services in the FSM) that cannot practicably be duplicated by a potential competitor. Therefore, the TRA will declare the Pohnpei Spur a bottleneck facility.

³⁴ TRA, “Comments Received Bottleneck Facilities Consultation: 1 June – 25 June 2021”, p. 9, available at: <https://tra.fm/wp-content/uploads/2021/07/Comments-Received-Bottleneck-Facilities-.pdf>

Submarine facilities that do not currently exist, but are expected to exist in the foreseeable future

- 121 In the market where submarine cables do not currently exist (i.e., Kosrae State), there is nothing to duplicate. At the present time, there is no reason to believe a submarine cable landing in Kosrae would be materially less expensive than the cables landing in the other States (see Table 2), or be able to accommodate a materially different amount of traffic (and therefore make a potential duplicate cable economically viable). However, it may be some time before such a cable is built, and conditions may change by then.
- 122 Therefore, the TRA has not declared a future submarine cable landing in Kosrae to be a bottleneck facility at this time, although unless material changes take place in the market between now and the time that the Kosrae cable is commissioned, the TRA would likely declare the Kosrae cable to be a bottleneck facility following its commissioning. Prior to making any such decision, the TRA would repeat the assessment here at the relevant time.

Terrestrial Facilities

Stakeholder views

- 123 FSMTC originally submitted that:
- it is practicable for a potential competitor to build a terrestrial fiber optic facility
 - the cost to build, maintain and operate (including cost of personnel) a terrestrial fiber optic network is the key determinant of whether that fiber optic network can practicably be duplicated
 - The TRA need to consider separately (1) areas where fiber is duplicated, (2) areas where only one fiber network exists, and (3) areas where no fiber is constructed
 - FSMTC does not differentiate by product (i.e. point-to-point vs FTTP).
- 124 At the second conference, and in follow up written comments, FSMTC argued that OAE will likely duplicate FSMTC’s terrestrial FTTP facilities. FSMTC also reiterated its view that the cost of duplicating terrestrial FTTP facilities is relatively low and that any “serious competitor” should be able to incur these costs. FSMTC also raised concerns that resources would be wasted if the TRA declared a facility to be a bottleneck but that facility was later duplicated.
- 125 iBoom submitted that “Duplicating a fiber access network that connects everyone makes no financial sense... and only hurts the people and the end users.”³⁵
- 126 At the second conference, iBoom also argued that it feels its new entrant status and small scale warrant carving iBoom’s assets out of any determination on bottleneck

³⁵ TRA, “Comments Received Bottleneck Facilities Consultation: 1 June – 25 June 2021”, available at: <https://tra.fm/wp-content/uploads/2021/07/Comments-Received-Bottleneck-Facilities-.pdf>

facilities. The TRA notes that there are no mechanisms in the definition of bottleneck facility in the Act that allow us to consider special treatment for a particular party. Therefore, we have focused our analysis on facilities and their position in the market, rather than the status of the party that owns the asset.

- 127 CPUC, OAE and DTC&I agreed that it does not make any economic sense to duplicate terrestrial infrastructure, with CPUC stating “we cannot make the economic business case to cover all of Weno. Duplicating the network is not financially possible.” And DTC&I added that the economies of scale in a small market like FSM need to be taken into account, along with the expected return of investment and high cost of services for the business products.³⁶
- 128 During the first conference on bottleneck facilities, CPUC also raised the point that “you can duplicate, but why would a public corporation duplicate cost to the people. It is not practical to have customers cover the costs [of duplication].”³⁷

Other evidence and analysis

Relevance of costs

- 129 The definition of “bottleneck facilities” in the Act specifies that the reasons why a facility cannot practicably be duplicated must be either “technical reasons” or “economies of scope and scale and the presence of sunk costs.” There is no evidence of technical³⁸ reasons why a potential competitor could not duplicate a terrestrial fiber optic network, therefore in these circumstances, the TRA agrees with FSMTC’s view on the key factor to assess whether duplication is practicable, that factor being cost.
- 130 No parties submitted evidence of costs associated with building, maintaining or operating a terrestrial fiber network.
- 131 During the first conference, iBoom commented on the cost of establishing a FTTP network, stating “It is very costly when you are starting from scratch... it is cost prohibitive, and unless you are very passionate for the people then nobody in their right mind as a competitor would have proceeded to duplicate the terrestrial fiber network on Yap.”³⁹
- 132 Some information on the potential costs of building a FTTP network is available from public and confidential sources.

³⁶ “Comments Received Bottleneck Facilities Consultation: 1 June – 25 June 2021”

³⁷ TRA Bottleneck Facilities First Public Conference 14 July 2021 – 01:38:00 in accessed recording

³⁸ Possible “technical reasons” include, without limitation, inability to access land, poles or rights of way necessary to build a duplicate fiber facility.

³⁹ TRA Bottleneck Facilities First Public Conference 14 July 2021 – 01:33:40 in accessed recording

- OAE estimate of \$4-5 million to build an FTTP network across the FSM, with a further \$4-5 million to install drop wires to connect residences and businesses to that network.⁴⁰
- FSMTC has estimated a total cost of approximately [c-i-c ██████████] to complete FTTP infrastructure. This includes [c-i-c ██████████] to reach up to 2,800 premises in Kosrae, [c-i-c ██████████] up to 2,000 premises in Yap and [c-i-c ██████████] up to 7,650 premises in Pohnpei.⁴¹ (This evidence from FSMTC seems inconsistent with its comments in the second conference that the cost of duplicating terrestrial FTTP facilities is relatively low, but those later comments appear to relate to the cost of fiber optic cable and not the cost of building complete FTTP infrastructure).
- The World Bank, through the Digital Federated States of Micronesia Project, estimate costs of up to \$12 million for “constructing and installing domestic fiber optic and wireless networks and related infrastructure to strengthen domestic internet and telecommunications connectivity.”⁴²

133 Using a simple building blocks revenue recovery calculation, the TRA has modelled, at a high level, the required average revenue per user for a potential new entrant private operator to recover only the costs of building and operating its own FTTP network (“FTTP ARPU”).

134 We used the following assumptions:

- A new entrant builds and operates their own FTTP network in Kosrae, Yap and Pohnpei (rather than getting access to an existing network)
- The new entrant’s capital costs will be similar to those expected by FSMTC, the World Bank and OAE, though the investor will have to use private capital, rather than grant funding
- The new entrants’ operating costs will be similar to those expected by OAE for operating its FTTP network
- The new entrant will gain 50% market share once established.

135 We then also modelled the FTTP ARPU required by a new entrant that, instead of building its own FTTP network, gained access to an existing network. We modelled two scenarios:

⁴⁰ The OAE estimates that building the terrestrial fiber network along roads will cost an estimated \$4-5 million and that connecting individual homes and businesses to that network will cost an additional \$4-5 million. <https://fsmcable.com/2020/11/24/press-release/>

⁴¹ Email correspondence between FSMTC and TRA, 20 April 2020

⁴² World Bank, “Digital Federated States of Micronesia Project Appraisal Document”, page 15 available at: <https://documents1.worldbank.org/curated/en/432601585596558171/pdf/Federated-States-of-Micronesia-Digital-Federated-States-of-Micronesia-Project.pdf>

- Firstly, assuming that the existing network is a grant-funded network of the kind OAE in planning to build, with tariffs at the level announced by OAE
 - Secondly, assuming that the existing network is a privately-funded network, and the incumbent granting access would seek to recover its reasonable costs.
- 136 Our analysis showed that, on average over the first 10 years of operation, the FTTP ARPU required by the new entrant if building and operating its own network would need to be higher by:
- \$501 per year (\$42 per month) than when accessing an existing commercially-funded network
 - \$870 per year (\$72 per month) than when accessing an existing grant-funded network.
- 137 The increases in retail tariff would be much larger if the new entrant targeted just one geographic market. This is because operating costs and overheads would need to be spread over a smaller number of customers.
- 138 In FSM, \$42 is a very large monthly premium on tariffs. Such a premium would likely make it impossible for the new entrant to win any material market share against an incumbent with an existing FTTP network.
- 139 A key insight from our modelling is that two operators sharing one FTTP network (even if that network is privately funded) would reduce the total FTTP revenue requirement by \$2.9 million per year on average over the first 10 years of operation. If passed onto consumers through competition, this would be a significant saving. On the other hand, if the two operators compete using two separate networks, customers will be burdened with an additional \$2.9 million in charges annually.

Relevance of type of geographic area

- 140 FSMTC submits it has built terrestrial fiber networks in Yap, Weno, much of Pohnpei, and is starting to build in Kosrae. Based on the description, this appears to be FTTP. FSMTC reports that, as at the end of September 2021, it had [c-i-c ██████████ ██████████], spread across Chuuk, Pohnpei and Yap.
- 141 It is likely that FSMTC has also built point-to-point fiber in these locations. It is unclear whether the FTTP network consists primarily of primary fiber on main roads or whether it also includes secondary fiber extending into neighborhoods, and whether the FTTP network is “centralized” or “cascaded” (if the latter, the network might not be easily used for point-to-point – this is relevant to practicable duplicability).
- 142 iBoom has built some fiber on Yap which appears at this time to be a point-to-point fiber connecting two or three locations. These facilities appear to duplicate some existing FSMTC point-to-point facilities.
- 143 There is no evidence any other person has built terrestrial fiber, whether point-to-point or FTTP, at this time.

144 Therefore, the evidence suggests there are currently no areas where FTTP is duplicated, and only one area where point-to-point is duplicated (part of Yap). There are several areas where one FTTP fiber optic facility and possibly point-to-point fiber optic facilities (based on presence of FTTP) are currently built (Yap, Weno, much of Pohnpei, and possibly part of Kosrae). There are many areas where no fiber exists (i.e. rest of country).

Duplication of FTTP network facilities

145 In regards to the likelihood of duplication being practicable in the near future, OAE has expressed interest in building FTTP in Yap, Chuuk lagoon (i.e. excluding Weno), Pohnpei and Kosrae. In other words, OAE has effectively decided not to duplicate the FSMTC FTTP fiber optic facility in Weno. OAE considers it a sub-optimal use for funds to duplicate FSMTC's fiber on Weno. OAE states it needs access to fiber to connect to FSMTC radio towers (which are considered bottleneck facilities) to provide connectivity to service providers to allow them to provide services on the islands of Tonowas, Udot and Eot.⁴³

146 Therefore, while there is evidence that OAE intends to construct FTTP facilities in all four States:

- OAE FTTP has not yet been constructed and it is not clear how advanced OAE's plans may be as, with the exception of Yap State, OAE has not published plans under s 342 of the Act
- even if OAE constructs FTTP in all States, it might not do so in all parts of all four States (in particular, OAE does not plan to build FTTP in Weno where fiber already exists).

147 Indeed, we do not expect OAE to duplicate FSMTC's FTTP facilities or FSMTC to duplicate OAE's FTTP facilities. Per our modelling analysis described above, it is not likely practicable to duplicate FTTP in the FSM, irrespective of whether the licensee operating the FTTP network is FSMTC, OAE or a third party. Lastly, OAE is owned and controlled by the FSM Government. It is highly unlikely the FSM Government would require or allow OAE to duplicate assets already created by another FSM Government-owned entity.

148 The TRA considers the total addressable market to be premises with electricity. Per OAE, the total number of such premises outside of Chuuk is 8,112.⁴⁴ On Chuuk, FSMTC's current fiber network passes at least [c-i-c █████] homes. The cost estimates to construct an FTTP network to serve the potential customers outside Chuuk range up to \$12 million. It is challenging to cover the costs of building such a network, let alone the costs of maintaining and operating it, given the small customer base.

⁴³ TRA, "Comments Received Bottleneck Facilities Consultation: 1 June – 25 June 2021", available at: <https://tra.fm/wp-content/uploads/2021/07/Comments-Received-Bottleneck-Facilities-.pdf>

⁴⁴ FSMC Cable (2020), "FSM Wholesale Connectivity – Introduction for potential service providers", available at" <https://fsmcable.com/wp-content/uploads/2020/11/High-level-OAE-overview-for-RSP-2020.pdf>

- 149 However, the question is not whether it would be practicable to build but whether it would be practicable to duplicate the FTTP network, i.e. taking into account the fact that a competitor would already have built a network and would be serving part of the market. In this scenario, the potential competitor would have to incur the full cost of building, maintaining and operating the FTTP network, but it is reasonable to assume it would be able to gain only part of the potential market given that part of the total addressable market would already be served. This is not likely economically practicable.
- 150 As noted above, our modelling suggests that, even with a generous assumption of winning 50% market share, a new entrant trying to recover such an investment would need to increase the FTTP component of their retail tariff by some \$42 to \$72 per month (compared to what they could charge if they were able to access an existing network).
- 151 Lastly, the TRA disagrees with the notion that a possible future duplication of a bottleneck facility would mean material wasted resources for the owner of the incumbent network. The declaration of a bottleneck facility does not in and of itself create costs for FSMTC. Costs are likely to be incurred when FSMTC is required to negotiate an access agreement with a new entrant, or participate in a dispute resolution process over access. By definition, those costs are only incurred if a new entrant seeks access. However, if the new entrant intends to duplicate the facility, it is unlikely to waste its own resources seeking to negotiate access to the incumbent's facility.
- 152 New entrants will be aware that seeking access from FSMTC may well be a drawn out and possibly adversarial process. If FSMTC is correct, and duplicating the FTTP network is relatively inexpensive, in practice a new entrant would therefore be unlikely to seek access to FSMTC's FTTP assets, and no costs are likely to be incurred by FSMTC.
- 153 **Final decision:** duplication of an FTTP fiber optic facility on islands where one exists is not practicable for economic reasons, and the TRA will therefore declare these facilities to be bottleneck facilities.
- 154 In the event that an FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, the TRA would repeat the assessment here at the relevant time in order to determine whether FTTP facilities in that area continue to be bottleneck facilities.
- 155 Islands where no FTTP facilities exist are even less densely populated. Therefore, the factors that make duplication of an FTTP facility not practicable where FTTP already exists (high costs, small customer base) are magnified. If duplication is not practicable on islands where FTTP facilities currently exist, it is likely less practicable on islands where FTTP facilities do not currently exist.
- 156 Therefore, unless material changes take place in the market between now and the time that FTTP facilities are commissioned on other islands, the TRA would likely declare such facilities to be bottleneck facilities following their commissioning. Prior to making any such decision, the TRA would repeat the assessment here at the relevant time.

Duplication of point-to-point fiber facilities

- 157 There is limited information on the record on the cost to build point-to-point fiber facilities. However, generally speaking, point-to-point facilities require lower capital cost to build because fewer physical assets are required. However, they are also smaller in

scope, as they serve specific individual customers or provide backhaul for segments of a communications network.

- 158 If already built, the incumbent has some amount of influence over the likelihood of the facility being duplicated—the needs of the relevant customer have been met and the incumbent has incurred sunk costs. The incumbent knows that the customer may switch to another service provider if offered a better price or a better service, or both.
- 159 Acting rationally, the incumbent would seek to price competitively in a way that ensures any new entrant could not offer a better price. Nevertheless, operators and customers do not always act rationally. In practice, bypassing of incumbent networks by specialised competitors targeting large customers happens regularly in other markets. It is reasonable to expect this could also happen in FSM.
- 160 If not already built, whether the facility would ever be duplicated (as opposed to being built) would depend on the same considerations: once built, the facilities represent sunk costs and the owner, acting rationally, would seek to avoid bypass of its facilities.
- 161 However, in both instances, the relatively high revenues per individual customer (compared to the unit costs) for point-to-point connections mean that duplication of the facility (or replication with a microwave connection, as discussed earlier) is a distinct possibility.
- 162 It is important to note that the presence of pre-existing facilities does not necessarily mean any additional facilities are duplicates. For example, when the pre-existing facilities are fully utilized, an additional facility may be installed to cater for demand growth, rather than to duplicate service provision for existing demand.
- 163 **Final decision:** In many cases, point-to-point terrestrial fiber optic facilities can be practicably duplicated. The TRA will not declare all point-to-point fiber facilities to be bottleneck facilities. If any licensees consider that there is a case for specific point-to-point facilities to be declared bottlenecks, the TRA will assess those facilities individually on a case-by-case basis. Such an assessment will include an assessment of whether, in that specific case, the potential access seeker can access poles, rights of way, or other inputs necessary to build its own duplicate facility.
- 164 Thus, while in general point-to-point fiber might be duplicable, it may be that in some parts of the geographic market it is not practicably duplicable and a declaration of bottleneck facility might be necessary.

SUMMARY OF FINAL DECISIONS AND FINAL DETERMINATION

- 165 Having completed its consultation process and considered all feedback, the TRA has decided that:
- Where a submarine fiber optic facility exists, there are no alternative facilities that can produce the same or similar (i.e. competitive) services, and it is not practicable to duplicate any of the submarine fiber optic cable facilities in FSM for reasons of economies of scope or scale and sunk costs. All existing submarine

facilities, including the Pohnpei and Yap Spurs will therefore be declared to be bottleneck facilities.

- Internet access services provided using copper, mobile or satellite communications facilities are not an effective substitute for similar services produced using FTTP facilities. Copper, mobile and satellite facilities are therefore not alternatives to FTTP facilities. Duplication of an FTTP fiber optic facility on islands where one currently exists is not practicable for economic reasons, and the TRA will therefore declare these facilities to be bottleneck facilities.
- Point-to-point backhaul services provided using mobile or satellite communications facilities are not an effective substitute for similar services produced using fiber facilities. Mobile or satellite facilities are therefore not alternatives for point-to-point terrestrial fiber facilities. In many cases, point-to-point terrestrial fiber optic facilities can be practicably duplicated, in particular using microwave links when there is a line of sight between the two points being connected. The TRA will therefore not declare all point-to-point fiber facilities to be bottleneck facilities. If any licensees consider that there is a case for specific point-to-point facilities to be declared bottlenecks, the TRA will assess those facilities individually on a case-by-case basis.

166 The TRA's final Determination is provided in Appendix 1.

167 In order to implement this Determination, we expect to initiate in the near future a formal consultation under Section 102 of the Administrative Procedures Act as required by Section 391(2) of the Act.

Annex – List of defined terms

ARPU	Average revenue per user
C-i-C	Commercial in confidence
CLS	Cable landing station
CPUC	Chuuk Public Utility Corporation
DSL	Digital subscriber line
DTC&I	The Department of Transportation, Communication, & Infrastructure
FSMTC	Telecommunications Corporation of the Federated States of Micronesia
FTTP	Fiber to the Premise
GB	Gigabyte
Gbps	Gigabits per second
ITU	International Telecommunication Union
Mbps	Megabits per second
ONT	Optical Network Terminal
The Access Rules	The Interconnection and Access Rules, 2019
The Act	The FSM Telecommunications Act of 2014
The FSM	The Federated States of Micronesia
The OAE	The FSM Telecommunications Cable Corporation (Open Access Entity)
The TRA	The Telecommunication Regulations Authority
VoIP	Voice over Internet Protocol

The Authority has made, and hereby publishes, a determination that the following facilities are bottleneck facilities for the purposes of the FSM Telecommunications Act of 2014

- All submarine fiber optic cable facilities, including any ancillary equipment necessary for the operation of the cable (such as Power Feed Equipment) that have been built as of the date of this decision. For clarity, these are:
 - (a) The Yap Spur, consisting of the physical submarine cable from the Yap cable landing station to and including the branching unit on the SEA-US submarine cable system and of capacity on the SEA-US submarine cable from the branching unit to international termination in Guam;
 - (b) The Chuuk- Pohnpei Cable, consisting of the physical submarine cable from the Chuuk cable landing station to the Pohnpei cable landing station; and
 - (c) The Pohnpei Spur, consisting of the physical submarine cable from the Pohnpei cable landing station to and including the branching unit on the HANTRU-1 submarine cable system and of capacity on the HANTRU-1 submarine cable system from the branching unit to international termination in Guam.
- All fiber to the premise (FTTP) network facilities, consisting of optical fiber from and including the optical distribution frame in the relevant licensee's exchange(s) or cable landing station(s) to and including the termination point nearest to or inside the customer premises, or a socket in the customer premises, as the case may be, on islands where FTTP network facilities have been built as of the date of this decision. For clarity, these are Yap, Weno and Pohnpei. For the avoidance of doubt, fiber optic communications facilities that exclusively connect two customer locations or exclusively provide point-to-point backhaul services for a communications network are not considered to be FTTP network facilities.



Federated States of Micronesia
Telecommunication Regulation Authority
P.O. Box 1919 Pohnpei FM 96941
Tel: +691 320-2812 <http://www.tra.fm>

August 20, 2020

Mr. Fredy Perman
CEO, FSM Telecommunications Corporation
Mr. Pieter Bakker
CEO, FSM Telecommunications Cable Corporation
Mr. Lubuw Falanruw
Owner, Boom!, Inc.
Mr. Kembo Mida
CEO, Chuuk Public Utility Corporation

Gentlemen,

Thank you for participating in the TRA's July 14th, 2021, public conference on bottleneck facilities. A summary of the messages from attendees, and matters raised by the TRA, that emerged in the discussion that are relevant to progressing TRA's thinking on whether particular fiber optic communications facilities should be declared bottleneck facilities is attached to this letter and will be posted on our website, and we will take it into account in our decision-making.

Following the discussion at the public conference, we consider that additional information would be useful to our decision-making. Pursuant to our powers under section 379 of the Telecommunications Act 2014 (*Requirement to supply information or documents or give evidence*), we require that you answer the following questions. We will use your answers in deciding whether, and to what extent, fiber optic communications facilities are bottleneck facilities for the purposes of the Act.

1. Do you currently offer, or plan to offer within the next 12 to 24 months, broadband Internet access service?
2. If yes, do you currently offer it, or plan to offer it, to retail customers only, other licensees only, or both?

3. In which geographic areas, for example, in which islands, and if relevant in which municipalities, do you currently offer or plan to offer the service?
4. Which of the following communications facilities do you currently use, or plan to use, to provide the service? If more than one, also indicate the predominant facility that you currently use, or plan to use.
 - submarine fiber optic cables
 - terrestrial fiber optic cables
 - terrestrial copper cables
 - satellites
 - other
5. If you have already built the communications facilities, indicate separately for each of them and by geographic area where you currently offer or plan to offer service, the percentage of the customers' premises (homes or businesses) passed that already have the technical and commercial means to be connected to the network (i.e. no further construction or reconfiguration of the facilities is required, other than installation of a copper or fiber drop wire or a satellite terminal).
6. If you are currently offering or planning to offer the service using communications facilities:
 - a. you have built: what were your costs of construction and are your annual costs of operation and maintenance of the communications facilities; or
 - b. that you plan to build: what are your estimated costs of construction and annual costs of operation and maintenance of the communications facilities?

Provide this information by the smallest of the following geographic areas for which information is readily available:

- State
 - Island
 - Municipality
7. What are your existing or anticipated non-recurring (one-time) and monthly recurring prices for the service, and, as applicable, associated usage caps or limits, upload and download speeds, availability,

latency, jitter, and delay? If you have more than one plan, provide the information for the lowest- and highest-priced plans.

8. Describe any other factors which may affect the quality of service offered to customers.
9. Describe in detail any factors which have adversely affected or are anticipated to adversely affect your costs to construct, operate and maintain the communications facilities in question (e.g. access to land or rights of way, access to skilled personnel, etc.)

Please respond **by no later than 5pm September 10th, 2021.**

When responding to the above questions, please indicate whether and explain why you consider any of the information to be "sensitive information" as defined in section 322 of the Act. We may publish some or all of your answers to the questions, unless it is "sensitive information."

Sincerely,



Takuro Akinaga
Chief Executive

Appendix 3 – 20 August 2021 key messages from first conference



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Key Messages Raised in the Public Conference on Bottleneck Fiber Optic Communications Facilities

20 August 2021

Introduction

The TRA hosted a public conference on Bottleneck Fiber Optic Communications Facilities by Zoom on 14 July 2021. The conference was attended by representatives of FSMTC, OAE, CPUC, Boom! Inc. and DTC&I.

The TRA is grateful for the extensive discussion and contributions by the stakeholders in attendance. The TRA notes that much of the discussion among attendees was general, and often related to stakeholders' views on a range of topics, including relationship matters and ongoing disputes between licensees, the appropriateness and validity of the regulatory regime, the role of the TRA, and the merits of telecommunications competition in FSM. To the extent such topics are not relevant to answering the question of whether certain fiber optic communications facilities are bottleneck facilities, they are not included in this summary and will not form part of the record of this consultation.

This summary is not a transcript of the proceedings, nor does it seek to summarize all of the discussion. The summary focuses on messages from attendees, and matters raised by TRA, that emerged in the discussion that are relevant to progressing TRA's thinking on whether particular fiber optic communications facilities should be declared bottleneck facilities pursuant to the Telecommunications Act 2014.

Key Messages Raised in the Public Conference

We summarize below the key messages presented by attendees during the conference. These represent the views of the attendees and not the TRA's own views or decisions on the matters.

1. Facilities should not be considered holistically. Subsea cables should be analyzed individually, and terrestrial facilities should be analyzed by geographic area.
2. A single physical facility access to which is controlled by a single party may need to be considered differently to a single physical facility where arrangements are already in place to allow access for more than one party.

An example of this is the Pohnpei spur of the HANTRU 1 cable. FSMTC owns the cable, but provides access to half of the spectrum on the cable to FSMTCC pursuant to the Infeasible Right of Use Deed that is in place between the two entities.

3. While most facilities can technically be duplicated, the key issue is whether it is practicable to do so. The main determinant of whether it is practicable to duplicate the facility will be the cost of procuring, operating and maintaining the facility.
4. Where subsea cables are controlled by a sole party, while it is technically possible to duplicate the facility, it is not practicable to do so because of the high cost of procuring and installing a new cable.
5. The costs of duplicating terrestrial fiberoptic facilities in FSM may differ materially by region, including between different:
 - a. States
 - b. islands within a single State
 - c. distinct areas on a single island

For example, duplicating a fiberoptic network in a major population center where a submarine cable landing station already exists will likely be cheaper than in less densely populated and more remote parts of the same island.
6. Where some geographic areas have a fully developed terrestrial fiber network (for example Weno), and others do not, this may be a sign of differing market characteristics, and potentially different considerations when deciding whether a facility in each area should be declared a bottleneck.
7. Facilities that are planned, but not yet built (like the submarine cable to Kosrae) may need to be considered differently to existing facilities.
8. An important relevant consideration is whether satellite facilities are sufficiently strong substitutes to fiber facilities for the purposes of both:
 - a. international/inter-island connectivity, and
 - b. providing services to individual retail consumers
9. In considering the above, it is important to examine whether satellite services can provide access:
 - a. to the same set of retail consumers as terrestrial fiber
 - b. at a quality that is sufficiently comparable to fiber
 - c. at a price that is sufficiently comparable to fiber.

Appendix 4 – 27 September 2021 sample information request



Federated States of Micronesia
Telecommunication Regulation Authority
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September 27, 2021

Mr. Fredy S. Perman
CEO/President
FSM Telecommunications Corporation
P.O. Box 1210
Kolonias, Pohnpei FM 96941

Dear Fredy,

The TRA greatly appreciates your answers to the questions set out in our letter of 20 August. Having reviewed the answers provided by all parties, we consider that additional information would be useful to our decision-making. In order to progress the TRA's work on whether particular fiber optic communications facilities should be declared bottleneck facilities, the TRA requires additional specific information on the minimum standards and unit costs of providing services that your organization has achieved, or is planning to achieve, using fiber optic or alternative facilities.

Pursuant to our powers under section 379 of the Telecommunications Act 2014 (*Requirement to supply information or documents or give evidence*), we require that you provide the following information. We will use the information in deciding whether, and to what extent, fiber optic communications facilities are bottleneck facilities for the purposes of the Act. For ease of collating the responses, Appendix 1 provides a response template that we would appreciate you filling out. We will also provide the template in the form of an excel file, and would appreciate you submitting your response electronically if possible.

Minimum standard of service

1. Please indicate the minimum standard of service that you are currently achieving or plan to sustainably achieve (whichever is superior) for approximately 99% (or other percentage as indicated by you) for the telecommunications services that you are providing or receiving. Please provide at least:
 - a. the upload speed on the connection
 - b. the download speed on the connection
 - c. the latency on the connection
 - d. the jitter on the connection
 - e. the availability of the connection in terms of percentage of time the connection is available and achieving the indicated speeds and latency in a typical year,

for each of the following services if they are relevant to you (you either supply these services or purchase them in order to enable you to supply telecommunications services to customers):

- a. Satellite backhaul services to enable internet traffic to flow to and from FSM and between islands in the FSM
- b. Submarine backhaul fiber services to enable internet traffic to flow to and from FSM and between islands in the FSM
- c. Fiber to the Premise (FTTP) broadband services for a typical household or small business
- d. Fixed Wireless broadband for a typical household or small business
- e. Satellite to customer services for a typical household or small business
- f. Digital Subscriber Line (DSL) broadband services using copper wires for a typical household or small business

We expect that, at a minimum, the above items a to f would be applicable for your organization.

To the extent that targeted or achievable service levels for each service materially differ by geographic area within FSM, please provide the above information broken down by relevant geographic area and an explanation of what causes the material difference in service levels. To do this, please insert additional rows where relevant in the response template and specify the relevant geographic location.

Unit costs and average revenues

2. For the services that you included in your answer to Question 1 please provide the approximate unit cost you are paying or plan to pay your suppliers (if you are purchasing the service), or the average revenues you are earning or plan to earn from your customers (if you are selling the service) as follows:
 - a. for satellite backhaul services, please provide the unit cost or average revenue per Gbps per month
 - b. for submarine backhaul fiber services, please provide the unit cost or average revenue per Gbps per month
 - c. for FTTP services, please provide the unit cost or average revenue per connection per month
 - d. for Fixed Wireless services (if relevant)
 - e. for satellite to customer services please provide the unit cost or average revenue per connection per month
 - f. for DSL services please provide the unit cost or average revenue per connection per month

Please identify whether your customers are or will be other licensees or retail end-users. If you supply or plan to supply services to both, report your prices or proposed prices to each separately.

To the extent that the unit costs or average revenues for each service materially differ by geographic area within FSM, please provide the above information broken down by relevant geographic area and an explanation of what causes the material difference in cost or revenue levels. To do this, please insert additional rows where relevant in the response template and specify the relevant geographic location.

Please respond **by no later than 5pm October 15th, 2021**.

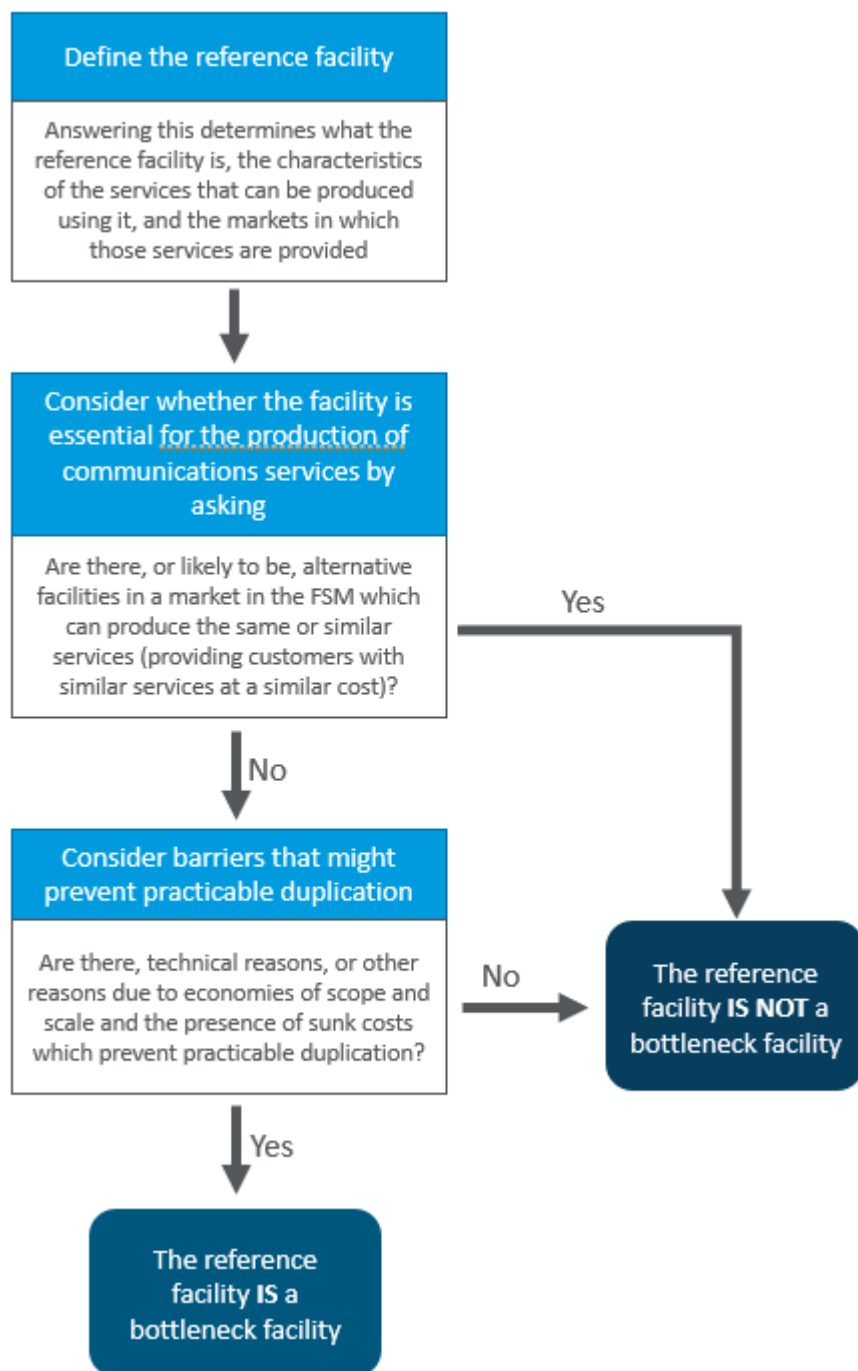
When responding to the above questions, please indicate whether and explain in detail why you consider any of the information to be “sensitive information” as defined in section 322 of the Act. We may publish some or all of your answers to the questions, unless it is “sensitive information.”

Sincerely,



Takuro Akiyama
Chief Executive

Appendix 5 – Bottleneck facility determination methodology



Appendix 6: Comments received on the Draft Decision on Bottleneck Facilities and TRA’s responses

Table A.1: Summary of comments received after the release of the Draft Decision on Bottleneck Facilities

Participant	Comment	TRA response
OAE	<p>It pleases me to inform you that FSMT Cable Corporations fully supports TRA’s draft decision and determination of Bottleneck Facilities.</p> <p>While the comments below do not affect the draft determination, they do identify a couple of small points for discussion in the draft decision:</p>	<ul style="list-style-type: none"> The comments are noted.
	<p>Decision ¶ 19-23. It is true that because the definition of “access” in the Act applies to bottleneck facilities, the TRA can only compel “access” to non-bottleneck facilities. However, the TRA has other powers that enable it to regulate physical infrastructure that would function in a similar manner (see discussion below). Taken out of context, these statements might lead some stakeholders to believe that the TRA has no power to regulate physical infrastructure unless it is deemed a bottleneck facility.</p>	<ul style="list-style-type: none"> The comments are noted and addressed below.
	<p>¶ 22. While it is true that TRA’s power to compel “access” and to decide “access” disputes under Section 340 of the Act is limited to bottleneck facilities, the definition of “interconnection” under section 302(v) of the Act is not limited to bottleneck facilities and extends to the “physical and logical linking of communications networks of different licensees.” (emphasis added). The Act also provides the TRA with other powers under the Act, including those related to competition, that would provide the TRA with authority to issue orders or make regulatory determinations with respect to facilities that are not bottleneck facilities.</p>	<ul style="list-style-type: none"> The interconnection rules only regulate those facilities that are necessary to effect a connection between two separate networks so that customers of one licensee can communicate with customers of the same or another licensee, or to access the communications services of another licensee. The interconnection rules do not apply to essential facilities that are needed by a licensee to produce communications services for its own customers. The competition rules address anti-competitive behavior which is a separate issue. The fact that a licensee controls a bottleneck facility does not necessarily mean that the licensee in question is behaving in an anti-competitive manner.
	<p>¶¶ 59-61. While FSMTCC agrees that each state is a separate geographic market, it may be that some states (such as Chuuk) consist of more than one geographic market, at least for submarine cables. Imagine a separate cable connected to the Mortlock Islands, or to the northern or western outer islands of Chuuk. It is not clear that these cables would be serving the same market as the Chuuk lagoon cable that lands in Weno. Similarly, although the markets are too small to</p>	<ul style="list-style-type: none"> The comments are noted. As noted in paragraph 111 of the Draft Decision, the Authority would repeat the assessment of whether a new submarine fiber optic facility is a bottleneck facility, including the definition of the relevant geographic market, as and when such a new submarine fiber optic facility is built.

support a cable, the outer islands of Pohnpei and some of the outer islands of Yap may not be in the same geographic market as the cables that service the main island in those states.

¶ 61 The statement in the draft decision that “Two cables connecting to one State, and providing connectivity for that State, do not create two markets, but rather two facilities that serve the same market” might not be correct. This may or may not be true depending on where in the states the cables land. Also, if there was a domestic submarine cable (for example within the Chuuk lagoon) that would seem to come within the definition of “submarine cable” set out by TRA in ¶ 55 of the decision, but such a cable would not be serving the same market as the CP cable, it would be acting as an extension of the CP cable.

- The comments are noted. Whether the definition of the relevant geographic market needs to be modified following the construction of a new submarine fiber optic facility would be determined at the time the Authority assesses whether that submarine fiber optic facility is a bottleneck facility.

iBoom

Because iBoom was put in a situation of the most challenging circumstances from both Yap CLS, as well as Guam CLS, we do not have enough definition of what "access to capacity to international termination in Guam" really means and any available technical terms definition? As you may or may not know, the conditions we were specifically told that would be made available for us at both Yap CLS, as well as at Guam CLS for Yap's fiber, we found actually not to be accurate, as it required us in building out enormous workarounds and filling gaps that were costly, and simply could have been avoided had there been more transparency, sharing of information and/or different decisions made out of our controls. These factors created not only extensively costly delays, despite overhead expenses, infrastructure expenses to fill in gaps along the way, as well as short & long term contract's incurred by iBoom with 3rd parties in order to cover all bases, as so many unknowns had to be dealt with using all potential outcomes to be covered.

- The comments are noted.
With respect to the definition of “access to capacity to international termination in Guam,” we note that both the Yap Spur and the Pohnpei Spur consist of two components. The first component is a length of submarine cable owned by an FSM licensee (the OAE and FSMTC, respectively) which runs from a cable landing station in the FSM to a branching unit on another submarine cable on the seabed (the SEA-US and HANTRU-1 cables, respectively). The second component is an Indefeasible Right of Use (IRU) on that other submarine cable which enables a connection and the transfer of traffic from the branching unit to a termination point in a landing station in Guam. Without the IRUs, international connectivity via the Yap Spur and the Pohnpei Spur would not be possible. If the Yap Spur and the Pohnpei Spur are declared to be bottleneck facilities, we consider that access must be provided to capacity in both components of the relevant Spurs in order that the licensee receiving access can obtain international connectivity from the FSM to Guam. The Determination in Appendix 1 has been amended to reflect this.
 - Because the Yap Spur and the Pohnpei Spur do not extend beyond a cable landing station in Guam, the declaration of bottleneck facilities would not apply to any other arrangements in Guam that the licensee may need in order to provide commercial services (such as cross-connectivity between the two Spurs or a connection to the global Internet). This is consistent with the TRA’s objective in Section 303(1)(b) of the Act to provide regulation that
-

is proportionate to the objectives set forth in the Act.

For the last bullet of the draft determination letter; (FTTP) - we have still been operating under many unknown factors; These are just a few examples;

- As you know, since 2019, iBoom, in anticipation, had asked several times how to proceed or what were the protocols or steps to move forward in starting its efforts to fast track operations for Yap's grossly underserved and unserved island(s) and communities; there were too many unanswered and unknown factors forcing iBoom eventually, with permission, to undertake all responsibilities, costs, delays made by decisions outside of our controls; everything iBoom has built to date, far and above its scope, has been borne on its own. It would seem unfair to simply brush all this under the rug, and allow any party (which we actually want to support), but not under conditions where it has been to the detriment at iBoom's costs and success. Again, we feel this is unique to iBoom circumstances.
- In 2020, at some point, iBoom got wind that FSMTC was by then already moving fast ahead in laying Fiber throughout the entire island of Yap, putting iBoom at great disadvantage. Per OAE & TRA, iBoom followed directions given, and sent a request to FSMTC, as per law's of Act 2014, for commercial agreement for just a handful of dark fiber strands, for two or so locations. All dark fiber requests were ignored and not given any answer to. This extended far beyond the Act 2014 regulations of 30 days, and in fact extended to much of the rest of 2020, to which point iBoom gave up the request. While there was some talk about the need to declare the Fiber a bottleneck facility at the time, and several other factors, such as waiting for plans and bids per OAE instructions, iBoom had no course of action for the majority of 2020.
- At some point between later at much time later, iBoom was given permission, which it received with great excitement with finally a course of action forward, iBoom without hesitation, immediately tried to proceed, at its own costs, with gusto

- We understand that, at this point in time, iBoom has constructed point-to-point fiber optic communications facilities on Yap. We are not proposing to declare point-to-point terrestrial fiber optic communications facilities to be bottleneck facilities, except as may be required in the future on a case-by-case basis. iBoom's existing fiber optic communications facilities would therefore not be subject to access obligations at this time.
- In the event iBoom constructs an FTTP network in the future, we will reassess whether FTTP networks on Yap are bottleneck facilities. If that future FTTP network duplicates an existing FTTP network, it is unlikely to satisfy the definition of "bottleneck facility" in the Act and therefore would not be subject to access obligations.

	<p>in delivering tangible results, despite still having very challenging limitations.</p> <ul style="list-style-type: none"> - In a nutshell, iBoom was put in a difficult situation, of taking up nearly all the costs, and even much larger costs unforeseen due to lack of information that was critical for iBoom to have known ahead of time. This has been the case to this day. 	
	<p>If time is of the essence, perhaps iBoom due to its unique situation as compared to other's, be separated from this portion of TRA determination as a temporary determination, until such reconciliation and mutual agreement and by the parties need to be met, whichever comes first.</p> <p>We applaud TRA for this effort, and we really wished it could have come in our time of need.</p>	<ul style="list-style-type: none"> ▪ The definition of "bottleneck facility" in the Act is based upon the characteristics of the facility in question and of the market in which it is used. It does not depend upon the identity of the owner.
<p>FSMTC</p>	<p>This letter is to be construed as our response on behalf of FSMTC and we wish to raise a number of important issues regarding the methodology used regarding designation of bottleneck facilities and the likely impacts that should be addressed and considered with any determination of bottleneck facilities.</p> <p>It is important to initially look at the law. [Section 302(f) is reproduced here in the original]</p> <p>This is the definition that is the foundation of the determination by TRA. [Section 339(1)(g) is reproduced here in the original]</p> <p>This provision is also cited at page 1 of the draft decision.</p>	<ul style="list-style-type: none"> ▪ The comments are noted.
	<p>RE paragraph 20, 21, 23, 37, 50: These determinations have to made though within the existing marketplace here in the FSM. The issue is low demand, small market...how does declaring bottleneck facilities increase demand? The intent of the liberalization law is to open the telecom sector to allow for market forces to be put to work and allow companies to compete in the market. Currently no major international competitors are expressing an interest in this market. Based on responses received in the current litigation, no one is claiming responsibility to even try and bring such competitors into the market. Even if they did come into the market, they would be immediately scared out of the marketplace if their infrastructure could be immediately declared a bottleneck facility. This type of</p>	<ul style="list-style-type: none"> ▪ A bottleneck facility is, by definition, a communications facility that is essential for the production of communications services and cannot practicably be duplicated by a competitor. Declaring a facility to be a bottleneck facility will encourage competition and entry into the market by enabling licensees to access facilities that they need in order to provide communications services but that they cannot practicably duplicate.

broad interpretation of the law does not encourage competition but will in fact limit competition.

In addition, the FSM is a small market. To our knowledge no studies have shown that there will be a substantial increase in the market to justify these findings, solely due to available market size in the FSM, the ability of the remaining population to pay commercial rates, and the steady decrease in population due to outmigration. Attached as Exhibit A is an article from the U.S., <https://www.govtech.com/network/fcc-launches-14-2b-broadband-program-for-low-income-families> showing that to increase internet use and availability in the U.S., a huge market compared to the FSM, the customers needed to be subsidized. To our knowledge, no such subsidies are being considered in the FSM.

- We anticipate that competition among licensees will bring innovation, quality and lower prices to the market, which will benefit all consumers in the market.
- We note that grant funding represents a form of subsidy, as does concessional debt financing from lenders with development objectives, and forgiveness of debts by such lenders.

Further, any interpretation of bottleneck facilities should not be used to provide a free ride to new competitors. Any use of bottleneck facilities requires free market and sustainable pricing. The owners of any bottleneck facilities also require enough income to sustain their own business. A declaration of a bottleneck should not be made unless data is provided to determine if a declaration of a bottleneck facility is economically feasible and will benefit the overall state of the telecommunications industry in the FSM.

- We do not propose that competitors receive “a free ride” on bottleneck facilities. Rather, we anticipate that licensees will negotiate mutually-acceptable rates, terms and conditions for access consistent with the Act and Access Rules. We note that the definition of “bottleneck facility” in the Act depends on the economic feasibility of duplicating the communications facility, not on the economic feasibility of the declaration.

FTTH Buildout

Initially the entire FTTH development cannot be a bottleneck facility as the terms of the World Bank funding per the Digital Micronesia Project is to build a universal fiber to the home system in all four states of the FSM.

I am attaching as Exhibit B the World Bank Financing agreement for the Digital Micronesia Project which includes the Fiber to the Home project.

I am also attaching as Exhibit C the World Bank Financing Agreement with OAE. These documents clearly state that FSMTC cannot own any of the FTTH buildout occurring under this grant. The only FTTH currently in existence has been built by FSMTC. Hence any buildout by OAE/The World Bank will be duplicative, creating a situation where there is no bottleneck.

It is quite clear regarding the obligations of the FSM and OAE under these financing agreements. (It should be noted FSMTC is

- If OAE does in fact duplicate FSMTC’s FTTP network, we agree that neither network would be a bottleneck facility in the areas where duplication has occurred. At the present time, though, OAE has not built an FTTP network anywhere in the FSM. Further, the terms of its existing financing arrangements do not permit it to duplicate existing FTTP facilities. In addition, it is unlikely that the FSM Government would require or allow an FSM Government-owned entity – OAE – to duplicate assets already created by another FSM Government-owned entity. The evidence therefore supports our determination that the FTTP networks in the FSM are bottleneck facilities. In the event that a FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, we would re-assess at the relevant time whether the FTTP facilities in that area continue to be bottleneck facilities.
-

not a party to any of these World Bank financing agreements.)

The Financing Agreement with the FSM, Exhibit B, Schedule 2, Section 1(A)(6) states in part.

[relevant section of Financing Agreement reproduced here in the original]

At all times OAE is a licensee of TRA and it is also acting in a competitive capacity. It appears OAE is a disguised retailer, as it appears to be assisting the appearance of competition, by supporting small retailers in the market and assisting them for free or not at market cost. Currently, they do not have any service agreements in place with any possible new retailers, even though they highlight on their web site that these are in fact new competitors.

- The OAE’s statutory role is to provide services to other licensees, including FSMTC. OAE is therefore not a retailer. We are addressing the matter of OAE’s service agreements in separate correspondence. In any event, OAE’s role in the market does not affect whether a communications facility is a bottleneck facility.

The project referenced here is grant funded. Per se as the terms of the grant funding and based on representations made by OAE in court documents, section 302(f) cannot possibly apply to FTTH since it cannot be a bottleneck facility.

A ‘bottleneck facility’ means a communications facility declared by the Authority to be essential for the production of communications services which, **for technical reasons or due to economies of scope and scale and the presence of sunk costs, cannot practicably be duplicated by a potential competitor in a communications market;** [emphasis in original]

OAE through the World Bank is already committed to duplicating the entirety of the FTTH so it is impossible to designate any of the current infrastructure developed by FSMTC as a bottleneck facility.

Conversely whatever FSMTC has already built cannot be a bottleneck facility because it can and will be duplicated. This building of the FTTH facility is not hypothetical unless OAE will now say the project is not going forward, or the World Bank has withdrawn funding. If so, such information should and must be disclosed to TRA immediately.

If OAE disagrees with this argument it then is incumbent upon them to produce detailed plans and business models to show its construction plan for FTTH, and to show what they are not in fact duplicating.

- If OAE does in fact duplicate FSMTC’s FTTP network, we agree that neither network would be a bottleneck facility in the areas where duplication has occurred. At the present time, though, OAE has not built an FTTP network anywhere in the FSM. Further, the terms of its existing financing arrangements do not permit it to duplicate existing FTTP facilities. In addition, it is unlikely that the FSM Government would require or allow an FSM Government-owned entity – OAE – to duplicate assets already created by another FSM Government-owned entity. The evidence therefore supports our determination that the FTTP networks in the FSM are bottleneck facilities. In the event that a FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, we would re-assess at the relevant time whether the FTTP facilities in that area continue to be bottleneck facilities.

However, the following attachments are from their Digital FSM web site. Exhibit D. [the contents of Exhibit D are listed here in the original]

- In the event that a FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, we would re-assess at the relevant time

<p>The Digital FSM postings promise a comprehensive FTTH buildout in all four states, and this is consistent even through the present.</p>	<p>whether the FTTP facilities in that area continue to be bottleneck facilities.</p>
<p>The following is a response to a request for admission by OAE. [the relevant request for admission and response are reproduced here in the original] In this admission, OAE is stating it should own all bottleneck facilities.</p>	<ul style="list-style-type: none"> This is not relevant to determining whether a communications facility is a bottleneck facility. The definition of “bottleneck facility” in the Act is based upon the characteristics of the facility in question and of the market in which it is used. It does not depend upon the identity of the owner
<p>However, based on witness testimony it also becomes unclear what they are trying to do. [parts of Exhibit E are reproduced here in the original] The transcript portions are attached as Exhibit E. The hearing testimony is contradictory to the postings attached from the Digital FSM project which also provides OAE as the contact address. At this point we don’t have any clue as to what OAE is doing, and they sought protection in the court case to not respond to FTTH issues in that case.</p>	<ul style="list-style-type: none"> The testimony provided by FSMTC suggests that OAE is refraining from duplicating FTTP networks. However, in the event that a FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, we would re-assess at the relevant time whether the FTTP facilities in that area continue to be bottleneck facilities.
<p>The issues raised here do not go to the issue of the wisdom or the feasibility of the program pushed by the FSM and the World Bank. This response assumes it will be implemented but we simply are requesting to know in detail what OAE is in fact going to build. OAE argued to the court, that these matters should be handled administratively before TRA. Obviously now is the time to address these issues. OAE has repeatedly stonewalled on providing detailed information on their FTTH project. Without such detailed information the TRA should not have enough information to rule, nor would it be prudent to rule on the determination of a bottleneck facility until such plans are disclosed. Obviously when they are going to build and what they are going to build are fundamental and foundational issues.</p>	<ul style="list-style-type: none"> The evidence available to the TRA suggests that OAE is refraining from duplicating FTTP networks. In the event that a FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, we would re-assess at the relevant time whether the FTTP facilities in that area continue to be bottleneck facilities.
<p>RE Paragraph 52: OAE and the World Bank have repeatedly stated they are going forward with the FTTH project in FSM, so there is no factual dispute that FTTH can practically be duplicated. RE paragraph 87, 91, 119, 136: However, OAE and the World Bank have repeatedly stated they are constructing a new FTTH system in all four states. This decision</p>	<ul style="list-style-type: none"> At the present time, OAE has not built an FTTP network anywhere in the FSM. Further, the terms of its existing financing arrangements do not permit it to duplicate existing FTTP facilities. In addition, it is unlikely that the FSM Government would require or allow an FSM Government-owned entity – OAE – to duplicate assets already created by another FSM Government-owned entity. The evidence therefore supports our determination that the

<p>should moot all contention that FSMTC owns bottleneck facilities.</p>	<p>FTTP networks in the FSM are bottleneck facilities. In the event that a FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, we would re-assess at the relevant time whether the FTTP facilities in that area continue to be bottleneck facilities.</p>
<p>Further, FSMTC has a mandate under its founding legislation which was reaffirmed under PL 18-52. [21 FSMC 203(2) through (8) is reproduced here in the original]</p>	<ul style="list-style-type: none"> • A declaration that a communications facility is a bottleneck facility does not prevent FSMTC from fulfilling its statutory mandate.
<p>It is actually unfair competition to allow competitors to profit from this mandate to seek below cost services from alleged bottleneck facilities. Any bottleneck facilities declared would and should recognize this mandate and the attendant expenses required to comply.</p>	<ul style="list-style-type: none"> • We do not propose that competitors seek or obtain “below cost services.” Rather, we anticipate that licensees will negotiate mutually-acceptable rates, terms and conditions for access consistent with the Act and Access Rules.
<p>RE paragraphs 73-76: Additionally, even though satellite is discounted in the analysis of bottleneck facilities it must be considered in a relevant analysis to determine what is its effect on the overall market? Requiring a sharing of fiber facilities may end up limiting effective competition by fiber. The analysis in paragraphs 73-76 is not that persuasive or effective in its overall findings. While fiber cable may have a bigger capacity, there is no determination of what customers need or use. If 95% of internet traffic is to download Netflix and to use Facebook or other digital media, excess capacity is not a factor in competition. Have there been any studies conducted on what number of customers actually would use the higher capacities described, especially if satellite can reach remote locations, not readily accessible to cable? Star Link is a potentially big competitor and cannot simply be disregarded concerning any future planning.</p>	<ul style="list-style-type: none"> • We assessed whether satellite services were potential alternatives to fiber services at paragraphs 73 to 79 of the Draft Decision and found that satellite provides lower capacity at lower quality and higher cost than fiber. We also addressed the potential entry of Starlink into the market at paragraph 74 of the Draft Decision. FSMTC has not provided evidence here to counter those findings. • Whether a communications facility is a bottleneck facility is defined by the Act. That definition includes an assessment of whether the communications facility is essential for the production of communications services, but does not depend upon an assessment of whether the communications facility is sufficient to satisfy or is in excess of what customers “need or use”. Further, what customers need or use is subject to change as more capacity and higher speeds are made available to them.
<p>RE paragraphs 137 – 139: It is unclear what the TRA is determining with these statements. Is TRA going to declare bottleneck facilities, then when OAE builds its network suddenly say they are not bottleneck facilities? What is meant by commissioning? When a new network is active or when it is being planned? It is unduly burdensome on one licensee, to create pricing structures, determine cost basis for temporary provision of services, or else to implement pricing and access to a bottleneck facility if such decision can be reversed at any time.</p>	<ul style="list-style-type: none"> • The objectives of the Act include “providing conditions for effective competition among service providers in the Federated States of Micronesia and encouraging efficient and sustainable investment in and use of communications networks and services.” Declaring a communications facility to be a bottleneck facility when it is in fact a bottleneck facility assists in achieving that objective. In the event that a FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, we would re-assess whether the FTTP facilities in that area continue to be bottleneck facilities when the duplicate FTTP facility is ready for use.

Further, how many facilities must potential competitors have access to? As a practical matter anything built or planned by OAE will then comply with the requirements under the interconnection laws. If they will build it, as they have repeatedly contended in litigation, then it is a moot point. There is no need for any use by other parties of current FTTH construction by FSMTC. Additionally, is OAE now a competitor of FSMTC for the use and control of these facilities?

- There are no alternatives to or duplicates of a bottleneck facility. The Act therefore requires potential competitors to be provided access to the bottleneck facility.
- In the event that a FTTP fiber optic facility is duplicated by new FTTP fiber optic facilities, we would re-assess at the relevant time whether the FTTP facilities in that area continue to be bottleneck facilities.

Lastly, the draft decisions speak in vague generalities. On what islands and what facilities is the TRA stating may be a bottleneck facility? It is impossible to oppose these draft findings when they are too indefinite to respond to. Is Yap a bottleneck facility? If so which islands and which locations, or is it the entire state? Without definition it is impossible to respond in any detail concerning what is there, what percentage of coverage there is and what is fiber, copper or other coverage.

- There is no ambiguity. The Draft Decision refers clearly to FTTP facilities and to the three islands where such facilities exist at this time. This can readily be ascertained.

[Section 31(1) of the Interconnection and Access Rules 2019 is reproduced here in the original]

In order to comply with the requirements above, FSMTC will need to evaluate its investment to come up with a cost based pricing mechanism, that will include a profit to reflect the risk of a reasonable investment. It would appear that these determinations would be fruitless and a waste of company resources if OAE and the World Bank are in fact building a comprehensive FTTH program.

Why would a regulator burden consumers with requiring FSMTC to create a brand new pricing system when the World Bank and OAE is building its own system?

- Section 31(1) of the Access Rules permits licensees to adopt any of three different approaches to setting prices for access to bottleneck facilities. We do not consider commercial negotiation or retail-minus prices to be unduly burdensome, and, given the recent nature of the FTTP facilities, information on their costs should also be reasonably available to FSMTC.

Overall, there is another major consideration that must be considered.

Financing Agreement with the FSM, Exhibit B. Schedule 2, Section 1(A)(6) states in part. This provision was cited earlier but it is extremely important on this issue.

[relevant section of Exhibit B reproduced here in the original, emphasis in original added to subsections (b) and (c)]

The World Bank is a driving force behind OAE, and is pressing the implementation of the Digital FSM program. Is the declaration of a bottleneck facility for all FTTH built by FSMTC the beginning of an expropriation attempt by the FSM and OAE to force a

- We stated at paragraph 21 of the Draft Decision that “a declaration that a facility is a bottleneck facility does not change or affect the ownership or control of that facility.”

<p>transfer of FSMTC’s infrastructure to OAE? That would work within the constraints of the grant scheme, but it would irreparably harm FSMTC.</p>	
<p>Again we seek to determine what is the actual implementation intent under the financing agreements entered into with the World Bank and being implemented by the FSM, OAE and even TRA?</p>	<ul style="list-style-type: none"> ▪ We are exercising our powers under the Act to achieve its objectives, including “providing conditions for effective competition among service providers in the Federated States of Micronesia and encouraging efficient and sustainable investment in and use of communications networks and services” and “providing efficient use of communications facilities and providing for cost-based interconnection and access on an equitable and non-discriminatory basis for operators of communications networks...”
<p>FSMTC is jointly owned by the states and the FSM, while OAE is solely owned by the national government. Such a taking is an expropriation, not a simple transfer of assets, and FSMTC states on the record it is wholly opposed to any such attempt at a transfer.</p>	<ul style="list-style-type: none"> ▪ We stated at paragraph 21 of the Draft Decision that “a declaration that a facility is a bottleneck facility does not change or affect the ownership or control of that facility.”
<p>As shown, OAE has already published a pricing model of \$10.00 per line for retailers on its FTTH systems, which have yet to be built. FSMTC cannot sustainably offer such a price on its systems that could be determined to be bottleneck facilities and cannot be compelled to follow unrealistic pricing proposals. The pricing issue needs to be addressed consistent with any determination on bottleneck facilities.</p>	<ul style="list-style-type: none"> ▪ We are aware of OAE’s published prices for FTTP services and understand that no licensee gave OAE feedback on its proposals. ▪ We note that FSMTC is also entitled to avail itself of OAE’s services at those prices.
<p>RE paragraph 146: At this time FSMTC does not oppose this determination.</p>	<ul style="list-style-type: none"> ▪ Noted
<p>RE paragraph 80, 102-109: Pohnpei Spur finding These findings create an unnecessary burden on FSMTC. By unnecessarily declaring the Pohnpei Spur to be in its entirety a bottleneck facility, FSMTC is now subject to burdens imposed by the telecommunications act.</p>	<ul style="list-style-type: none"> ▪ We consider that if a communications facility satisfies the definition of “bottleneck facility” under the Act and if we do not declare it to be a “bottleneck facility” under the Act, a potential competitor could either be excluded from the market or could be forced to make an inefficient and unsustainable investment in duplicate facilities to produce communications services, contrary to the objectives of the Act. This could prevent the development of effective competition in the FSM, contrary to the objectives of the Act, and could give licensees who own those facilities significant market power. ▪ As the Pohnpei Spur is one communications facility and as it is a bottleneck facility, it is necessary to declare it to be a bottleneck facility in its entirety.

[Section 302(f) of the Act is reproduced here in the original]

A “communications facility” can and should be determined to be a spectrum, after all TRA is regulating telecommunications. The access claimed by OAE has distinctions that can be distinguished.

- We note that the Pohnpei Spur falls squarely within the definition of “communications facility” as it is a “submarine cable landing in the Federated States of Micronesia.”
- In any event, no new spectrum was created or duplicated when FSMTC and OAE entered into the IRU Deed that transferred use of 8 wavelengths to OAE. Instead, existing wavelengths controlled by FSMTC were transferred to OAE for their use. The evidence, therefore, supports our view that the Pohnpei Spur cannot practicably be duplicated by a potential competitor.

[Section 389(2) and 339(1)(g) of the Act are reproduced here in the original]

Clearly, any new retailer could access the services needed from the Pohnpei Spur, through OAE. There is no limitation to any licensee on access from OAE, so there is no need to require duplicative access from FSMTC.

However, the declaration of a bottleneck facility for both halves of the Pohnpei Spur requires FSMTC to be held to the same standards for providing access as OAE is required under the telecommunications law, PL 18-52.

Again this establishes and creates regulatory and compliance burdens on FSMTC that are unnecessary. If OAE can address and distribute wholesale capacity from its spectrum then there is no need for a bottleneck determination. Again such requirement simply raises costs to be passed on to the consumer with no benefit to the consumer.

- Where a communications facility has been declared to be a bottleneck facility, the licensee who owns or controls it must then provide access to it to other licensees in accordance with the Act and the Access Rules. There is no basis for exempting the first licensee on the grounds that the first licensee has already provided access to it to another licensee.

FSMTC agrees with the finding in 105 that FSMTC does own the entire Pohnpei Spur. However, for the record, OAE is claiming an interest in the Pohnpei Spur which it acquired at zero cost, which is a dispute still before the court in this matter between FSMTC and OAE.

- We note the comment and the fact that the matter is still in dispute. However, this is not relevant to determining whether the Pohnpei Spur is essential for the production of communications services or whether it can practicably be duplicated.
-

Appendix 7: Comments received during second conference on Draft Determination and TRA’s response

Table A.2: Summary of comments received during second conference

Participant	Comment received	TRA response
OAE	OAE is in support of the draft determination.	The comment is noted.
CPUC	CPUC supports the draft determination, particularly for Chuuk Pohnpei cable being a bottleneck.	The comment is noted.
FSMTC	FSMTC believes a determination should not be universal but distinguished to certain areas.	<ul style="list-style-type: none"> The declaration relates to specific types of assets that TRA does not believe can be practicably duplicated. If the TRA is proven wrong and the assets are later duplicated, then the definition in the Act ensures that such assets cease to be bottleneck facilities. We consider this to be appropriate. The economics of building a small FTTP network within the FSM are universal. As our model demonstrates, even at a national scale, the costs of building, operating and maintaining a second set of FTTP network assets are high relative to the revenues likely available in the market, and making it smaller still will only make the economic viability worse.
	FSMTC stated iBoom and OAE are both building fibre optics which prove that fibre can be duplicated.	<ul style="list-style-type: none"> We understand that, at this point in time, iBoom has only built point-to-point facilities and no FTTP has been built yet The structure of our determination is that duplicated fibre will be re-evaluated for whether it should remain a bottleneck facility.
	FSMTC sought clarification on what is meant by ‘bottleneck facility for fibre optics’ and where a bottleneck facility starts and ends.	<ul style="list-style-type: none"> For FTTP, TRA are referring to the cable from the optical distribution frame in a Cable Landing Station or in a licensee’s exchange to the termination point nearest to or inside a customer’s premises, or a socket in a customer’s premises, into which the ONT is connected. We changed the second bullet of the Determination to clarify this.
	FSMTC stated the cost of 48,000m of cable on Kosrae cost \$11,000, which in its view is affordable for any serious competitor seeking to duplicate a network in Kosrae to provide services.	<ul style="list-style-type: none"> The cost of establishing and running an FTTP network is not simply the cost of the cable. TRA’s estimates are based in part on information provided by FSMTC and in part by OAE. The results of the financial model were made available with the Draft Determination.
	FSMTC stated there is an inconsistency in the draft determination: “In section 146, you say point-to-point service is not a bottleneck because it can be built by others, but the in the draft decision you say ‘any fibre’ is a bottleneck”.	<ul style="list-style-type: none"> Point-to-point refers to a single link between one large customer and the provider’s assets. This is different to an FTTP network that allows connection of multiple customers. We distinguish this in paragraph 63 of the Draft Determination. Paragraph 146 of the Draft Decision expressly refers to point-to-point networks, stating: “The TRA does not intend to declare all point-to-point

	<p><i>“fibre facilities to be bottleneck facilities.”</i> [emphasis added]</p> <ul style="list-style-type: none"> The 2nd bullet in the Draft Decision in Appendix 5 expressly states “<i>All fiber to the premise (FTTP) network facilities...</i>” [emphasis added] and does not mention “any fiber” or point-to-point networks.
<p>FSMTC stated that if bottlenecks can be declared now, and then reversed later if the network is duplicated, this can lead to a waste of resources.</p>	<ul style="list-style-type: none"> A declaration does not create resource wastage. Resources get used only when negotiating with potential access seekers, and participating in any further regulatory processes to set access tariffs. Access seekers can decide whether to duplicate the network or to negotiate access and, if that is unsuccessful, to apply for a regulatory determination of access pricing. If it genuinely makes sense to duplicate the network, new entrants will do so without seeking access, and no resource use for FSMTC will result.
<p>FSMTC stated that if its network is declared a bottleneck and then a new network is built in a year or two, this will be counterproductive to FSMTC to hire the resources needed to determine a pricing scheme for the short term</p>	<ul style="list-style-type: none"> Resources are only required if someone seeks access. New entrants will be aware that seeking access from FSMTC may well be a drawn out and possibly adversarial process. If FSMTC is correct, and duplicating the FTTP network is relatively inexpensive, a new entrant is unlikely to seek access to FSMTC's FTTP assets, and no costs are likely to be incurred by FSMTC.
<p>In reference to the Pohnpei Spur, FSMTC stated OAE already has a share of the facility and is a wholesale provider – so what are FSMTCs obligations in this case?</p>	<ul style="list-style-type: none"> Where a communications facility has been declared to be a bottleneck facility, the licensee who owns or controls it must then provide access to it to other licensees in accordance with the Act and the Access Rules. There is no basis for exempting the first licensee on the grounds that the first licensee has already provided access to it to another licensee.
<p>FSMTC believes the following actions show duplication to be possible and want to ensure TRA address them before a final decision is made:</p> <ul style="list-style-type: none"> The World Bank/OAE want to build its own network iBoom has built its own network 	<ul style="list-style-type: none"> There is no evidence to suggest OAE is planning to duplicate FSMTC's FTTP network. OAE is owned and controlled by FSM Government. It is highly unlikely the FSM Government would require or allow OAE to duplicate assets already created by another FSM Government-owned entity. We understand that iBoom assets are point-to-point and duplicate those installed by FSMTC, and are a good example of why TRA has not declared point-to-point fiber as a bottleneck at this time.
<p>FSMTC questioned if the determination of everything owned by FSMTC is a step towards having the government expropriating FSMTCs assets.</p>	<ul style="list-style-type: none"> The TRA's powers under the Act relate to determining access on reasonable terms to bottleneck facilities, not changing asset ownership or compelling free provision of access services.
<p>iBoom</p> <p>iBoom made the following comments in relation to its presence in the market:</p> <ul style="list-style-type: none"> iBoom has minimal presence on Yap, but had to build all of its own infrastructure, from Yap CLS to Guam CLS, to get fiber on Yap 	<ul style="list-style-type: none"> TRA cannot provide special treatment to any party. Our task is focused on determining whether facilities are bottlenecks. If a facility cannot be practicably duplicated, it does not matter if it owned by a large incumbent provider or a new entrant like iBoom.

-
- iBoom considered it did not have the same advantage as FSMTC when it came to building the network, as FSMTC had funding help
 - Ultimately, a lot of time, effort and money was put into duplicating the network
 - iBoom does not feel that it falls within the broad definition [of bottleneck?]
 - Interconnectivity between infrastructure, and lack of cooperation, is acting as a bottleneck for iBoom
- We understand that iBoom assets are point-to-point and duplicate those installed by FSMTC, and as such are a good example of why TRA has not declared point-to-point fiber as a bottleneck at this time.
-

Appendix 8: TRA invitation letter to cross-submit

From: takuro.akinaga@tra.fm <takuro.akinaga@tra.fm>

Sent: Wednesday, March 2, 2022 7:40 PM

Subject: RE: Second consultation Conference on the bottleneck facilities

Dear all,

This is to thank you for having attended the second consultation conference this morning. As I mentioned if you wish to send the final round of comments, please send them before 5 pm on March 18, 2022.

Regards,
Takuro

Appendix 9: Comments received as cross-submissions after the second consultation conference

Table A.3: Summary of cross-submission feedback and responses

Participant	Comment received	TRA response
FSMTC	<p>"I was a bit concerned when the representative from Castalia, Mr. Anton Murashev, refused to answer a direct question if the ultimate plan was for the TRA to declare numerous bottleneck facilities in order for the FSM to then expropriate such facilities."</p>	<ul style="list-style-type: none"> Paragraph 21 of the Draft Decision states that a bottleneck declaration does not change the ownership or control of a facility. For the avoidance of any doubt, the TRA is exercising the functions and powers given to it by the Act in order to achieve the objectives of the Act. These include the power to declare facilities to be bottlenecks in order to promote competition. These do not include the power to expropriate or transfer the ownership of communications facilities.
	<p>"If the goal of the telecommunications act is to promote competition and increase services, we need to be advised who is competing, what competition they are offering, and under what conditions the services need to be provided."</p>	<ul style="list-style-type: none"> We agree that regulatory decisions should not be made in a vacuum and we note that the TRA is making these decisions and determinations in the FSM context (see paragraphs 46 and 51 of the Draft Determination). However, the information sought here is not required in order for the TRA to assess whether a fiber optic communications facility is a bottleneck facility. To the extent that it is, we have already assessed it, for example, the likelihood of a competitor duplicating an existing fiber optic communications facility.
	<p>"For the Pohnpei Spur, we have the following concerns.</p> <ul style="list-style-type: none"> ...We disagree with the TRA's contention that the Pohnpei Spur is an individual unit that cannot be distinguished." 	<ul style="list-style-type: none"> As discussed at paragraphs 103 to 108 of the Draft Decision, FSMTC conveyed to OAE rights to certain spectrum wavelengths (not fiber strands) in the Pohnpei Spur pursuant to an IRU Deed between the two licensees. Notwithstanding that its capacity is shared, the Spur is a single communications facility owned by one party, and neither fiber strands nor wavelengths were duplicated when the OAE obtained its rights to those wavelength from FSMTC.
	<p>"For the Pohnpei Spur, we have the following concerns.</p> <ul style="list-style-type: none"> ...What obligations would FSMTC have if the Pohnpei Spur is a bottleneck?" 	<ul style="list-style-type: none"> The obligations were described at paragraphs 19 and 20 of the Draft Decision. This includes making services available to other licensees on its fibers if requested by those other licensees. The fact that one licensee sharing a bottleneck facility makes services available on its part of the bottleneck to third-party licensees does not relieve the owner of the bottleneck facility from its own obligations under the Act and the Rules to share that facility.
	<p>"For the Pohnpei Spur, we have the following concerns.</p> <ul style="list-style-type: none"> ...World Bank consultants have repeatedly pushed for the entire 	<ul style="list-style-type: none"> A declaration as a bottleneck facility does not change the ownership of the facility. The purpose of a declaration is to promote competition. A declaration over the entire

<p>Pohnpei Spur to be taken from FSMTC and given to OAE, which would seem to be the only reason for declaring the entire cable a bottleneck. FSMTC objects to such a designation.”</p>	<p>Pohnpei Spur, which is a single facility, achieves that purpose.</p>
<p>“If OAE/World Bank is going to construct FTTH throughout the FSM, how can there be a bottleneck? The entire plan for the OAE/World Bank is to construct FTTH in all four states.”</p>	<ul style="list-style-type: none"> • There is evidence that OAE intends to construct FTTP facilities in all four States. However: <ol style="list-style-type: none"> 1. OAE FTTP has not yet been constructed and it is not clear how advanced OAE’s plans may be as, with the exception of Yap State, OAE has not published plans under s 342 of the Act. 2. Even if OAE constructs FTTP in all States, it might not do so in all parts of all four States. In particular, OAE does not plan to build FTTP in Weno where fiber already exists (see paragraph 132 of the Draft Decision). There may therefore be areas where existing FTTP is not duplicated, despite OAE’s intent to construct FTTP in all four States. <p>Indeed, we do not expect OAE to duplicate FSMTC’s FTTP facilities or FSMTC to duplicate OAE’s FTTP facilities. Per our analysis as set out at paragraphs 120 to 126 of the Draft Decision, it is not likely practicable to duplicate FTTP in the FSM, irrespective of whether the licensee operating the FTTP network is FSMTC, OAE or a 3rd party. In addition, it is unlikely that the FSM Government would require or allow an FSM Government-owned entity – OAE – to duplicate assets already created by another FSM Government-owned entity. The finding in paragraph 136 of the Draft Determination is therefore supported.</p>
<p>“If the statement is untrue that the World Bank is not funding FTTP on all islands, but instead will seek to use FTTP developed by others, including FSMTC, it must be disclosed at this time.”</p>	<ul style="list-style-type: none"> • To the best of our knowledge, WB is not seeking "to use FTTP developed by others". Rather it is offering funding to the FSM Government, subject to certain conditions, for the latter to build FTTP across the FSM.
<p>“If OAE/World Bank is not going to construct FTTH throughout the FSM, then we need to know their detailed plans so we can comment? Pieter Bakker’s statement during the public hearing was pretty damning. If OAE is not building and designing the FTTH then who is?”</p>	<ul style="list-style-type: none"> • We note that Pieter Bakker actually said "<i>The OAE only acts as an implementing agency. We do not do anything else than what the government wants to do.</i>" (at 49:45 of the recording)
<p>“Clearly it is premature to declare a bottleneck facility on FTTP wherever it is built, until either OAE, the FSM or the World Bank actually disclose their plans. Such a finding would be a clear denial of due process.</p>	<ul style="list-style-type: none"> • On the contrary, it would be premature to declare a facility, that otherwise satisfies the definition of bottleneck, NOT to be a bottleneck, until plans to construct a duplicate facility are disclosed.
<p>“Explain 146 point to point versus the draft determination that all complete facilities are bottlenecks. What facilities is TRA</p>	<ul style="list-style-type: none"> • In paragraph 63, we distinguished between two different configurations of fiber: point-to-point (i.e. a connection between two specific

<p>defining? We need to know so we can comment.</p>	<p>locations) and FTTP (which passes by a large number of premises). Paragraph 146 of the Draft Decision expressly refers to the former while the 2nd bullet in the Draft Determination in Appendix 5 expressly refers to the latter.</p>
<p>FSMTC claim that the draft decision in Appendix 5 is clearly overbroad.</p> <p>“The TRA found in the body of the document that point to point facilities, specifically to customer homes are not bottleneck facilities, section 146, unless a licensee requests such a determination and TRA makes an independent assessment. To the knowledge of FMSTC, no requests were made and no independent assessments were conducted. As a result the draft finding in Appendix 5 should be vacated.”</p>	<ul style="list-style-type: none"> ▪ Point-to-point connects two different locations. FTTP is what passes by multiple customer homes. They are different and there are different decisions about whether they are bottleneck facilities. ▪ Note that paragraph 146, indeed paragraphs 140 to 147, do not refer to "customer homes". ▪ The second bullet of the Draft Determination in Appendix 5 expressly refers to FTTP facilities. It therefore does not apply to point-to-point facilities, which is consistent with paragraph 146, and the Draft Determination in Appendix 5 is therefore not overbroad.
<p>“The review being conducted on FTTP seems mainly to support the World Bank's desire to build infrastructure and then have OAE run the infrastructure. However, a serious competitor, especially concerning fiber optic connectivity would build their own infrastructure. If that can be declared a bottleneck and seized, or even if the same is done to FSMTC infrastructure, no serious and major international players would even consider coming into the FSM. Decisions must be made that are conducive to encouraging competition.”</p>	<ul style="list-style-type: none"> ▪ RE “<i>A serious competitor especially concerning fibre optic connectivity would build their own infrastructure.</i>”: A bottleneck facility is one that, by definition, is not practicable to duplicate - even by "a serious competitor." A declaration that a facility is a bottleneck facility is therefore conducive to encouraging competition. <p>Again, it is worth noting that we declared subsea cables and FTTP, not point-to-point, to be bottleneck facilities precisely because we considered that competitors would not be able to build the first two but that they might be able to build the last one.</p> <ul style="list-style-type: none"> ▪ RE “<i>If that can be declared a bottleneck and seized...</i>”: This is not the effect of a bottleneck declaration under the Act. No assets are "seized" and no ownership is changed by virtue of a declaration.
<p>“Again it is premature to determine a bottleneck on FTTP when so much information has not been provided. The decision in section 137 shows the impracticality of making such a determination now.”</p>	<ul style="list-style-type: none"> ▪ There are sufficient grounds to declare certain facilities to be bottlenecks at the present time. However, the market is not static and regulation should evolve with the market. The TRA will review its declaration if circumstances change, which is what paragraph 137 indicates.
<p>“Further, there would be expenses to comply with a bottleneck facility designation, which would also be wasted if other facilities were commissioned...”</p>	<ul style="list-style-type: none"> ▪ The evidence available to the TRA and described in the Draft Determination is that it is not practicable to duplicate submarine and FTTP facilities. It is unlikely, therefore, that other facilities will duplicate them in the future. The effort expended by FSMTC, OAE or any other owner of bottleneck facilities to comply with a bottleneck declaration is unlikely to be "wasted" and will in fact promote competition.

<p>“How can pricing determinations be possible in this small market? Is this a step to having FSM expropriate these facilities?”</p>	<ul style="list-style-type: none"> As stated in paragraph 21 of the Draft Decision, a declaration of bottleneck does not change the ownership or control of the facilities in question.
<p>In reference to section 31(1) (a) to (c), “These statements are all well and good, but who will provide the input on such pricing, and are we looking at years of disputes over such pricing...”</p>	<ul style="list-style-type: none"> Consistent with s. 339 of the Act, licensees are to negotiate access agreements in the first instance. Lengthy disputes are less likely if the parties comply with the Act and Rules, in particular s. 339(2)(a) to (c) of the Act.
<p>“Additionally this seems to be a not very covert attempt to take away all of FSMTC’s fiber facilities.”</p>	<ul style="list-style-type: none"> As stated in paragraph 21 of the Draft Decision, a declaration does not change the ownership or control of the facilities in question.
<p>“...TRA should implement workable and realistic expectations and solutions to the issue of bottleneck facilities, and not simply follow the expectations of others.”</p>	<ul style="list-style-type: none"> The TRA is exercising its own functions, duties and powers under the Act.
<p>“The definition of bottleneck facilities will also be impacted regarding the implementation of competitive satellite services, competition from satellite must also be considered under the relevant definitions.”</p>	<ul style="list-style-type: none"> Satellite services were considered at paragraphs 74 to 87 of the Draft Decision and were found not to be alternatives.
<p>“iBoom!’s facilities must also be analyzed under the criteria used to determine bottleneck facilities. If the TRA is solely looking at facilities constructed by FSMTC...”</p>	<ul style="list-style-type: none"> The TRA considered iBoom's point-to-point facilities at paragraph 129 and 131 of the Draft Decision.
<p>“FSMTC states unequivocally on the record it is opposed to the use of the bottleneck facility designation to form the basis for expropriation of its facilities.”</p>	<ul style="list-style-type: none"> Noted. However, a declaration by the TRA that a communications facility is a bottleneck facility does not change the ownership or control of that facility.