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Implementing thousand-block pooling

Summary

Telephone numbers are a finite resource and a key building block at the heart of our modern communications system. Due to the emergence of many new services in recent years (such as Voice over Internet Protocol [VoIP] and Internet of Things applications), and the continued increase in cellphone use, more numbers are needed to serve Canadians.

As a result, recent industry forecasts indicate that the current Canadian inventory of geographic numbers, which are numbers associated with specific regions of Canada, could exhaust before 2030.

In March 2023, the Commission issued Telecom Notice of Consultation 2023-92 (the Notice) to seek comments on implementing thousand-block pooling (TBP). TBP would involve assigning numbers to telecommunications service providers (TSPs) in blocks of 1,000, rather than 10,000. Currently, TSPs are automatically assigned blocks of 10,000 numbers when extending service to a new area, regardless of the size of the area. This can often lead to many assigned numbers remaining unused.

In the Notice, the Commission set out its preliminary view that TBP should be implemented in Canada. With general consensus among interveners, the Commission confirms its preliminary view and **directs** local exchange carriers and wireless carriers to implement TBP by **6 October 2025**.

In addition, the Commission is applying several measures to numbering administration in Canada. These measures aim to shift the industry's focus towards number preservation. This includes new policies directing that (i) geographic numbers be used only where truly required, (ii) increased scrutiny be applied to requests for numbers, (iii) there be a clear mechanism to return unused (or inappropriately used) numbers from previous assignments, and (iv) carriers interconnect to exchange traffic to and from non-geographic numbers.

Canadian carriers will have to invest resources, exercise leadership, and collaborate as part of the CRTC Interconnection Steering Committee's working groups to identify and implement effective solutions to address the issue of number exhaust.

The Commission's determinations will ensure that Canada's remaining inventory of telephone numbers is managed responsibly to the benefit of all Canadians who rely on telecommunications as an essential aspect of their everyday lives.

Introduction

1. The Commission administers telephone numbers and other numbering resources pursuant to section 46.1 of the *Telecommunications Act* (the Act), working with other stakeholders in Canada and internationally within the North American Numbering Plan (NANP).

2. Under the NANP, Canada is assigned a certain number of Numbering Plan Areas (NPAs), also known as area codes. Each NPA includes 791 central office (CO) codes (the three digits following the area code in a ten-digit number), which are assigned to Canadian carriers by the Canadian Numbering Administrator (CNA). Each CO code in turn includes 10,000 telephone numbers, which carriers use to serve their customers. NPAs, CO codes, and telephone numbers can be deemed geographic or non-geographic, depending on whether they are associated with a specific region. Once all CO codes in a specific NPA have been assigned to carriers, a new NPA is implemented to provide relief.

3. Long-standing policies and processes that benefit local and long-distance competition have led to number assignment rules that do not always favour number preservation. For example, currently, when a carrier extends services to a new area, it is assigned an entire CO code composed of 10,000 geographic numbers without regard to population or whether the carrier needs that many numbers. This leads to many numbers remaining unused.

4. While this may not have been a concern in the past, the fast growth in mobile telephony and data, voice over Internet Protocol (VoIP), and Internet of Things (IoT) services has led to a proliferation of connected devices to which numbers are assigned for addressing, billing, and other purposes.

5. The combination of an increased rate of implementation of relief NPAs across Canada in recent years and current industry number use forecasts indicates that the need for geographic NPAs in the next five to six years will exceed what is assigned to Canada under the NANP. The current inventory of geographic NPAs is down to eight, five of which have been set aside for relief of specific areas, leaving only three NPAs that have not been set aside by the Commission for future relief of a specific region.

CSCN Report

6. On 22 June 2022, the Canadian Steering Committee on Numbering (CSCN) of the CRTC Interconnection Steering Committee (CISC) submitted the following consensus report:

- *Potential Remedies for CO Code and NPA Exhaust*, (CNRE135A) [the CSCN Report].

7. The CSCN Report identified, among other things, two methods to implement the assignment of smaller blocks of numbers, namely thousand-block pooling (TBP) and CO code sharing.[1]

Telecom Notice of Consultation 2023-92

8. After considering the CSCN Report, the Commission determined that it must take timely action to address NPA and CO code exhaust in order to help extend the lifespan of Canada's inventory of numbers.

9. The Commission therefore issued Telecom Notice of Consultation 2023-92 (the Notice). In the Notice, the Commission stated the preliminary view that TBP should be implemented in Canada, and asked several questions related to the administration of numbering resources and number exhaust.

10. The Commission received interventions from Bell Canada, on its own behalf and on behalf of its subsidiary Bell Mobility Inc. (Bell Canada); Bragg Communications Incorporated, carrying on business as Eastlink (Eastlink); the Canadian LNP Consortium Inc. (CLNPC); the Canadian Numbering Administration Consortium Inc. (CNAC); the Independent Telecommunications Providers Association (ITPA); Iristel Inc. (Iristel); Neustar, Inc. (Neustar);[2] Quebecor Media Inc., on behalf of Videotron Ltd. and Freedom Mobile Inc. (QMI); Rogers Communications Canada Inc., on its own behalf and on behalf of Fido Solutions Inc. and Shaw Telecom G.P. (RCCI); Saskatchewan Telecommunications (SaskTel); TekSavvy Solutions Inc. (TekSavvy); and TELUS Communications Inc. (TCI).

Interim measure

11. In a Secretary General letter dated 30 October 2023, the Commission implemented an interim measure requiring the CNA to limit the assignment of geographic CO codes to certain levels specified in the letter. The Commission further directed the CNA to increase its scrutiny of CO code requests. The Commission indicated that a more cautious approach to the assignment of geographic CO codes was warranted until a permanent solution to number exhaust is implemented.

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[1] Under the TBP method, any carrier requiring numbers is issued a block of 1,000 numbers, instead of 10,000 as is the practice today. Under the CO code-sharing method, the first company to apply for numbers from the shared CO code would become the CO code holder, and subsequent carriers would be responsible for initiating the bulk porting of numbers from the CO code holder to them.

[2] Neustar is the NANP Administrator and the operator of the Number Portability Administration Center (NPAC) for Canada and the United States.

Issues

12. The Commission has identified the following issues to be addressed in this decision:

    - Should TBP be implemented in Canada and, if yes, how should it be implemented?
    - Is there a need for a neutral administrator for TBP and should the cost recovery model for number administration be modified?
    - Should carriers have to justify the quantity of number blocks they request?
    - Could previously assigned CO codes that include large quantities of unused numbers be added to the number pooling inventory?
    - What regulatory changes are needed to support TBP and a more efficient use of numbers?
    - What other measures are needed to support an efficient use of numbers?

Should TBP be implemented in Canada and, if yes, how should it be implemented?

Positions of parties

13. Parties generally supported the preliminary view of implementing TBP as an effective way to help preserve numbers. While Bell Canada noted that no studies of the benefits of doing so have been conducted, interveners agreed that it is the appropriate approach and that there is urgency to proceed.

14. Parties submitted that changes to the industry's systems and processes would be required, which would be costly, complex, and time consuming.

15. Several parties shared the view that TBP should be implemented consistent with the implementation in the United States (U.S.), to allow off-the-shelf solutions that will reduce costs and implementation time. This includes implementing TBP only in areas where local number portability (LNP) and wireless number portability (WNP) have been implemented[3] – i.e., where location routing numbers (LRN)[4] are used for routing purposes – and maintaining routing based on six digits. These parties indicated that implementing TBP in exchanges where number portability has not yet been implemented (non-portable exchanges) would require telecommunications

[3] LNP and WNP permit customers to retain their number when moving to a new telecommunications service provider within the same exchange.

[4] An LRN is a 10-digit number used to uniquely identify a switch that has ported numbers. Calls to a ported number are routed based on the number's associated LRN.

service providers (TSPs) to expend significant resources where the demand for numbers may not be high enough to justify the implementation costs.

16. TCI submitted that TBP should be made available on the same date that number portability is implemented in any given exchange. It further submitted that the Commission may wish to consider whether the public interest is better served by directing that number portability be implemented in non-portable exchanges to allow TBP. TCI indicated that being in the position to enable TBP may be very important if an NPA is in jeopardy and if there are requests for new codes in non-portable exchanges, but it is not a prerequisite for the initial implementation of TBP. TCI added that it may be necessary to retain the segregation of CO codes between wireless and wireline numbers due to the differences between these regimes with respect to number porting.

17. Parties generally supported a uniform block size of 1,000 numbers, consistent with the U.S. The ITPA suggested that smaller blocks could be implemented after the industry has adjusted to blocks of 1,000 numbers but opposed different block sizes between urban and rural areas. SaskTel submitted that assigning smaller blocks would be trying to fix an almost non-existent problem. On the other hand, TekSavvy submitted that blocks of 500 or 100 numbers would be practical for exchanges in smaller rural communities.

18. CNAC submitted that since Canada uses the Business Integrated Routing and Rating System setup to support blocks of 10,000 and 1,000 numbers, any blocks of different sizes would be incompatible. It added that older incumbent local exchange carrier equipment may not be able to support blocks with fewer than 1,000 numbers and automated systems may have to be updated at a greater cost.

19. Neustar submitted that when a valid request is received under TBP, a new CO code is opened with the requestor assigned as the CO code owner; however, only the requested and justified quantity of blocks with 1,000 numbers would be allocated to the requesting carrier, and the remainder of the blocks would go to the number pooling inventory associated with the area. Neustar submitted that this is the normal, default approach in the U.S., where CO code ownership for LRN purposes is needed.

20. The timelines proposed for the implementation of TBP included 12 months (TekSavvy); 12–24 months (Neustar); 24 months (CNAC, Eastlink, Iristel, QMI, and RCCI); 30 months (TCI); and 36 months (Bell Canada).

Commission's analysis

21. There is significant support for implementing TBP as soon as possible. While it will be a complex project, the Commission considers that TBP is the most practical option to help prevent number exhaust. Canadian carriers, CISC, the CNA, and Neustar (as the number portability administrator) will have to work together to ensure the required system, infrastructure, and process changes are in place.

22. The Commission considers that TBP implementation should, to the greatest extent possible, mirror the U.S. approach. It should be implemented, at least initially, for new geographic number assignments in exchanges where number portability has been implemented, and should be based on six-digit routing and the LRN architecture. Going forward, TBP should be made available on the date that number portability is implemented in any additional exchange.

23. While parties suggested that the absence of competition in smaller rural exchanges without number portability would translate into low demand for numbers, the Commission is concerned that this view does not fully account for the impact of certain wholesale provision of numbers.[5] Furthermore, some providers could favour obtaining numbers from these exchanges to avoid TBP.

24. The CSCN Report also referred to the concept of "facilitated LRN," which could be useful in certain circumstances to provide carriers with the ability to obtain blocks of 1,000 numbers in areas where they do not have a prior footprint (i.e., without being registered as owner of an entire CO code). While this may not be an optimal configuration in most cases, and Neustar indicated that the default approach in the U.S. provides for the requesting carrier to be allocated only the numbers it needs, the Commission considers that facilitated LRNs should be permitted and encourages carriers to use that approach where it makes sense for number preservation.

25. The Commission considers that a block of 1,000 numbers is the optimal size, at least initially, because it is consistent with the routing system and would enable the use of off-the-shelf solutions.

26. With respect to an appropriate timeline for implementation, the Commission considers that an implementation date of no later than 20 months from the date of this decision is appropriate because (i) there is urgency to act, as stated in the Notice; (ii) 20 months is within the time frames proposed by parties; and (iii) the industry can draw on the processes in place in the U.S and, in some cases, they may already be doing some preparation work based on the preliminary view in the Notice.

27. With respect to TCI's submission that it may be necessary to retain the segregation of numbers between wireless and wireline technology, the Commission considers CISC to be the appropriate entity to assess whether this segregation can be avoided to further contribute to number preservation.

28. In light of the above, the Commission **directs** local exchange carriers (LECs) and wireless carriers to

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[5] Iristel submitted that wholesale customers often choose numbers with no regard to their geographical factors. For example, it submitted that a wholesale customer who wants a contiguous block of 6,000 numbers could potentially choose a rural exchange solely because Iristel happens to hold 6,000 contiguous numbers there, as opposed to choosing it because of the geographic location of the exchange.

- implement TBP, in all exchanges where number portability has been implemented, for new number assignments from geographic NPAs. TBP is to be implemented no later than **6 October 2025** and is to be based on six-digit routing and the LRN architecture;

- make TBP available on the same date that number portability is implemented in any exchange that does not have number portability as of the broader TBP implementation date; and

- make the required changes in their equipment and systems, and work together and with their vendors and relevant entities involved in numbering administration to implement TBP consistent with this decision.

29. For any number assignment (including initial assignment) under TBP, only the requested and justified quantity of blocks of 1,000 numbers are to be allocated for the requesting carrier's actual use, with the remaining numbers being attributed to the number pooling inventory associated with the area.

30. Further, the Commission **directs** the CLNPC to make any required modifications to the Number Portability Administration Centre (NPAC) Service Management System.

31. The Commission also requests that CISC

    - facilitate and monitor the implementation of TBP and assist in resolving any challenges;

    - file quarterly progress reports on 30 March, 30 June, 30 September, and 30 December until TBP is operational; and

    - as part of its first quarterly progress report, advise the Commission as to whether the segregation of numbers between wireless and wireline technology must be retained or whether this requirement can be eliminated as a further way to preserve numbers.

32. The Commission intends to monitor, through forecasts, requests for information (RFIs), and other means as necessary, the wholesale provision of numbers and its impact on number exhaust in exchanges where number portability is and is not available.

Is there a need for a neutral administrator for TBP and should the cost recovery model for number administration be modified?

Positions of parties

33. Parties agreed that a neutral administrator is required for TBP and that the existing CNA should fulfill that role. CNAC submitted that this would be a natural extension

to what the CNA is doing and that funding for the additional duties should be based on the CNAC funding model.

34. Bell Canada, RCCI, TCI, and TekSavvy were in favour of modifying the cost recovery model for numbering administration, which is based on a percentage of telecommunications revenues, to a model tied to number use to promote number preservation. There were different opinions on whether a new formula should rely only on number use or on a combination of revenues and number use. Eastlink and Iristel opposed changing the funding model, and SaskTel was of the view that the cost of creating a new methodology may outweigh the benefits. QMI submitted that smaller number blocks will lead to more requests. Therefore, if the methodology is changed, it is important that rates remain just and reasonable for carriers. QMI added that there should be a mechanism to request multiple blocks of 1,000 numbers.

Commission's analysis

35. The Commission considers that a neutral third-party administrator is needed for TBP and that the existing CNA is best suited for this function since it has the required knowledge, people, and foundational systems in place.

36. With respect to the cost recovery model for numbering administration, there is insufficient information on the record for the Commission to assess this issue. However, the Commission is of the view that there is merit in considering alternative funding models, particularly if this can support number preservation efforts. The Commission notes that CNAC has created a committee to review the funding model and could be asked to submit a proposal for the Commission's consideration on which all carriers and interested persons could comment.

37. In light of the above, the Commission **directs**

- the CNA to assume the role and functions of TBP administrator;
- CNAC to make the required changes to its service agreement with the CNA to include the additional TBP administration duties; and
- CNAC to file a Part 1 application, by **5 April 2024**, broadly serving its application on all LECs and wireless carriers registered with the Commission, and recommending (as appropriate) changes to the funding model for numbering administration, or options for such changes. CNAC should include the pros and cons of each option and the anticipated impacts on carriers and on number preservation.

38. With respect to QMI's submission that there should be a mechanism to request multiple blocks of 1,000 numbers, QMI and other industry stakeholders will be able to provide input on the TBP procedures through participation in CISC.

Should carriers have to justify the quantity of number blocks they request?

Positions of parties

39. Bell Canada argued that mechanisms to protect against inefficient number assignment already exist. Under the Canadian Central Office Code (NXX) Assignment Guideline (CO Code Assignment Guideline), the CNA may perform audits to ensure effective number use and may use the reclamation process for CO codes that remain unused or are not used in accordance with the CO Code Assignment Guideline. The CNA is also responsible for monitoring inconsistencies between forecasts and actual results. Bell Canada submitted that a carrier's request for numbers should be assessed based on its current number use and demand forecasts.

40. CNAC submitted that given that Canada is close to depleting its pool of reserved geographic NPAs and that numbers are a scarce and finite resource, some level of oversight and justification is prudent. CNAC submitted that a carrier should be required to support its request with customer demand information and only request additional numbering resources when necessary, with the view to preserving such resources. Further, the Commission could inquire as to the carriers' and wholesale holders' use of already-assigned CO codes and numbers to determine if, and to what extent, numbering resources are being underused or used contrary to the CO Code Assignment Guideline.

41. Iristel opposed any additional requirement to justify number use. Iristel submitted that it would be difficult, if not impossible, for it to obtain justification for number use given the wholesale environment in which it operates, beyond the regular forecasting surveys that it currently performs with its wholesale customers. Iristel submitted that Internet Protocol (IP) telephony enables services that were not envisaged when number assignment rules were first introduced. In its view, to add a major burden to justify number use would run contrary to the requirements of paragraph 2(f) of the 2023 Policy Direction[6] to "enable innovation in telecommunications services, including new technologies and differentiated service offerings."

42. The ITPA submitted that if there were an arbiter with the power to potentially deny a request for additional blocks, the selection of the arbiter and any appeal process may raise complex questions that would need to be resolved. The ITPA submitted that if there is a need for some oversight of requests for new blocks, the Commission should place greater reliance on the forecasting process.

43. Neustar noted that in the U.S. TBP implementation, reporting on number use was viewed as an important part of successfully stemming number exhaust, and specific

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[6] *Order Issuing a Direction to the CRTC on a Renewed Approach to Telecommunications Policy*, SOR/2023-23, 10 February 2023

criteria were defined as to the circumstances under which the assignment of number blocks was justified.

44. QMI submitted that justifying the number of blocks required prior to any assignment would be a barrier for TSPs and would increase the administrative burden on the CNA. In QMI's view, assigning numbers in blocks of 1,000 would allow for more efficient number assignment based on actual needs, and there should be a system to encourage TSPs that do not use all their assigned numbers to turn them over to the CNA.

45. RCCI submitted that carriers should justify the number of blocks they require. It noted that the CNA is already empowered to seek additional information about number use from applicants and argued that the CNA should increase its scrutiny of requests. RCCI submitted that if a carrier does not use all the number blocks it requests after a predetermined period of time, it should be required to return the unused blocks.

46. TekSavvy was of the view that carriers should be required to justify the size and quantity of number blocks they are ordering.

47. TCI stated that when an NPA is in a jeopardy condition (i.e., when the rate of CO code assignment in an NPA is high enough that remaining CO codes may be exhausted before NPA relief is implemented), the Commission scrutinizes new applications for numbers to ensure that the remaining CO codes are used in a way that maximizes public benefit. TCI submitted that it could be argued that the Canadian numbering system itself is nearing a jeopardy condition. In its view, TBP will be ineffective if carriers can be granted as many blocks as they want just by asking.

Commission's analysis

48. The industry is split on whether requests for numbers require more scrutiny. In the Commission's view, it would run contrary to the objectives of the Act to allow the consumption of Canada's scarce remaining NANP resources without evidence that they are being used for the purpose of providing Canadians with telecommunications services. Telephone numbers are at the very heart of facilitating the orderly development of a world-class telecommunications system. Accordingly, while the Commission must be mindful of innovation, this does not translate into allowing an inconsiderate use of scarce numbering resources to the detriment of the industry and, ultimately, Canadian consumers.

49. The Commission considers that the current regulation is not sufficient to prevent number exhaust. TBP alone will not resolve numbering exhaust if carriers are attributed large quantities of numbers without adequate scrutiny and, in some cases, without being able to tell what the numbers will ultimately be used for. As such, the Commission considers that it would be prudent to require carriers to provide additional substantiation when requesting additional geographic numbering resources.

50. With respect to Iristel's position that having to justify usage would run contrary to the requirements of the 2023 Policy Direction, the Commission considers that in accordance with section 2, requiring justification as a way to preserve geographic numbering resources would promote consumer interests and innovation, since it would ensure that affordable access to high-quality telecommunications services is available in all regions of Canada, including rural areas (paragraph 2(c)); and enhance and protect the rights of consumers in their relationships with TSPs, including rights related to accessibility (paragraph 2(d)). The entire industry will benefit from continued access to numbers, and any changes to the numbering administration process to include additional justification, which will require approval by the Commission, will take into consideration the impact on carriers and balance this with the need to ensure that the industry does not run out of numbers.

51. In light of the above, the Commission requests that CISC provide, by **6 May 2024**, recommendations to strengthen the number assignment guidelines, focusing on preserving geographic NANP resources, both while TBP is being implemented and once it is implemented. This includes considering the following:

    - to justify a new request, what consumer demand and number use information, and other information such as details of use associated with previous assignments, should be required (including the level of detail);

    - whether a carrier obtaining the numbers for another TSP or wholesale customer should be responsible for reporting on the use of those numbers and, if so, how;

    - what would trigger escalation of a particular request for numbers to the Commission;

    - what enforcement powers or tools may be appropriate for the CNA to use to scrutinize requests for numbering resources;

    - the potential use, as recommended in the CSCN Report, of enhanced forecasting tools, such as (i) an incremental linear annual geographic number survey; and (ii) wholesale resale considerations, such as whether third-party number use should become an annual part of the Numbering Resource Utilization Forecast reporting; and

    - any other relevant factor that might be consistent with an increased focus on number preservation.

52. While some of these considerations may already be covered to some extent in current guidelines, CISC should aim to enhance what exists, with a focus on number preservation. This should include careful consideration of practices in other NANP jurisdictions, including the U.S., with regard to what would constitute adequate justification. In providing its recommendations, CISC should also consider the

impact on competition balanced with the need to ensure that the industry does not run out of numbers.

Could previously assigned CO codes that include large quantities of unused numbers be added to the number pooling inventory?

Positions of parties

53. Bell Canada submitted that while previously assigned CO codes could technically be added to the number pooling inventory, this would create significant complexity and should be evaluated in subsequent phases for the following reasons:

    - there would be a significant risk of "contamination," where at least one number within the block is already assigned, which can result in subsequent calls or messages being sent to incorrect recipients; and

    - it may inadvertently disadvantage smaller TSPs by compelling them to implement TBP prematurely at significant cost, despite possible satisfaction with their current number pooling inventory.

54. In particular, Bell Canada submitted that the possibility of block contamination would result in the need for audits and examinations of all CO codes to properly identify and free up blocks for their potential return to the number pooling inventory. The greater the amount of contamination in a given CO code, the greater the cost and complexity of this process, which may ultimately become unviable if the reclamation of blocks within the CO code is low enough that the benefits to the industry are not meaningful.

55. CNAC submitted that there may be a considerable volume of unused blocks of 1,000 numbers with TSPs from prior assignments, particularly in small to medium-sized markets. CNAC submitted that the allowable block contamination level in the U.S. is 10% and that the criteria for Canada should be reflective of that. It argued that it is critical that lightly contaminated blocks be protected and added to the inventory at the earliest possible time, preferably at the same time as the implementation of TBP.

56. CNAC added that in the case of the rapidly growing IoT market, either the carrier obtaining the numbers or its third-party client should have a reclamation or reassignment process versus a "one and done" approach.[7] CNAC submitted that if "one and done" is eliminated, this may help to delay the exhaust of both geographic and non-geographic numbers.

57. Eastlink opposed adding already assigned CO codes to the number pooling inventory. Eastlink submitted that its systems do not assign numbers sequentially in order from first to last from a block; therefore, it would be extremely challenging to

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[7] CNAC submitted that "one and done" refers to a number assigned to a thing, like a vehicle, and when the thing is no longer in use, the number does not go back into the number pooling inventory.

claw back numbers from an assigned block. In Eastlink's view, a requirement to include previously assigned CO codes could require a change to its existing customers' telephone numbers.

58. The ITPA submitted that the Commission should not mandate the return of previously assigned numbers. It indicated that many number blocks have been partially assigned and many numbers that qualify as vanity numbers have been plucked from assigned blocks. The ITPA stated that its members report that returning unused numbers from partially assigned blocks would raise significant routing issues requiring internal time and effort to address.

59. Iristel submitted that there are a number of considerations related to previously assigned numbers and that if any of the numbers are not free of potential encumbrances,[8] they will not be fit to be reused. Iristel added that numbers may also be "burned" by private systems, which will render the number unusable for specific purposes.[9] Iristel argued that reallocation of previously used numbers, in a wholesale context, carries some potential implications that may not be immediately apparent and may cause problems for TSPs that must troubleshoot these issues for their end-users.

60. RCCI argued that CO code holders with large quantities of unused numbers that have been held for a reasonable length of time, e.g., five years or more, should be required to return the unused numbers.

61. SaskTel suggested that numbers could be returned to the number pooling inventory when a request for new numbering resources is made for a given exchange. In SaskTel's view, the additional costs of implementing a general cleanup of prior resource assignments does not appear justified.

62. TekSavvy submitted that large quantities of existing unused numbers should be added to the number pooling inventory at the beginning of TBP implementation for optimal results.

63. While TCI believed that previously assigned CO codes should be included, it recommended analyzing the costs and benefits at a later date. In its view, including previously assigned codes would require that all carriers modify their networks and

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[8] Iristel submitted that to be fit for reuse, the numbers must not be included in Short Message Service (SMS) or 4-1-1 listings, must not appear on the National Do Not Call List, and must be outside the 90-day disconnection blackout period.

[9] Iristel gave the example of a number resold to a wholesale customer, who then resells the number to a commercial entity that uses the number for two-factor authentication: If one of the end-users for two-factor authentication uses the number in connection with a violation of the terms and conditions of a popular social media site, the number is blacklisted in perpetuity by the social media company. The number is now "burned" and carries a history that may make it unsuitable for a specific purpose by another reseller.

systems for TBP even if they have no need for more numbers themselves, which could create delays.

Commission's analysis

64. The Commission considers that including previously assigned CO codes that contain large quantities of unused numbers in the number pooling inventory is critical to helping curb number exhaust. Moreover, while some parties commented that this should be considered in a later phase, after the implementation of TBP, the Commission considers that lightly contaminated blocks from previous number assignments need to be protected and added to the number pooling inventory at the earliest possible time.

65. CISC is best suited to determine the processes, criteria, and timeline that should be put in place to reclaim or return unused numbers from previously assigned CO codes, taking into account the contamination level, impact on smaller carriers, and any other relevant considerations.

66. Therefore, the Commission requests that CISC examine the inclusion of unused numbers from previously assigned CO codes in the number pooling inventory and file a report with the Commission by **6 August 2024**. The report should make recommendations on the best mechanism to accomplish this, taking into consideration

    - what level of contamination is acceptable;
    - whether there should be a general cleanup or other process, or both, and whether the process(es) should be voluntary or mandatory;
    - what other criteria may be relevant, such as the population or population growth of a given exchange;
    - whether number blocks should be returned if they are not used after a specific period of time;
    - how to mitigate the impact of potential encumbrances that might hinder the reuse of telephone numbers (e.g., Short Message Service [SMS] listings, National Do Not Call List listings, 4-1-1 listings, the 90-day disconnection blackout period, and burned numbers);
    - whether and how to curtail or prohibit the one and done approach in the case of IoT and other services;

- how the snap-back process would work with any new mechanism(s);[10]
- limitations applicable to smaller carriers; and
- any other relevant factor.

67. The report should also make recommendations on the detailed steps, roles and responsibilities, and timelines to implement the mechanism, including whether it should be implemented at the same time as the initial implementation of TBP or in a subsequent phase as soon as possible thereafter. It should also take into consideration the changes, if any, required to the existing bulk porting process or any other database, system, or process.

68. Number exhaust is an industry-wide problem that ultimately affects Canadians, and the Commission will not tolerate undue delays in implementing the determinations in this decision or the implementation of ineffective or only partially effective solutions. As required, the Commission will consider using any regulatory tool at its disposal to ensure that effective mechanisms are implemented and adhered to. Further, the Commission expects Canadian carriers to invest resources, exercise leadership, and collaborate as part of CISC working groups to identify and implement effective solutions that reflect a number preservation mindset.

What regulatory changes are needed to support TBP and a more efficient use of numbers?

Positions of parties

69. Parties identified, at a minimum, the following decisions or guidelines that would need to be changed to support TBP:

- Telecom Decision 97-8 and subsequent decisions, including Telecom Decision 2007-23, which require LECs to obtain a CO code in every exchange in which they offer local exchange service;
- the Commission's competitive local exchange carrier (CLEC) obligations;
- the CO Code Assignment Guideline, including the Location Routing Number (LRN) Assignment Criteria; and
- the Canadian Numbering Resource Utilization Forecast (C-NRUF) Guideline.

[10] This process is used within NPAC to return a number to the original CO code holder of record when the number is ported to another TSP and the customer subsequently cancels their service with that TSP.

70. Bell Canada submitted that certain adjustments may be required to its tariffs to account for TBP, and other incumbent local exchange carriers may also require corresponding changes to their own tariffs.

71. Several parties commented that new rules are required to limit the use of geographic numbers to certain services (e.g., voice services). They noted that the CSCN is currently evaluating, in Task Identification Form (TIF) 112, solutions to number exhaust with respect to non-geographic NANP numbers. Several parties shared the view that TIF 112 is the appropriate forum for addressing any new rules on non-geographic numbers.

72. In response to an RFI, Bell Canada, RCCI, and TCI confirmed that in the previous 18 months they had obtained geographic NANP CO codes from the CNA for services that did not technically require geographic numbers (e.g., services that could work with non-geographic or alternative non-NANP resources). Other carriers, including SaskTel and TekSavvy, responded that they had not. Iristel indicated that it was not able to provide detailed information of the use of numbers that are resold to other TSPs.

73. Further, on the question of whether there should be a restriction on the use of geographic numbers for certain services, Bell Canada did not believe this was the best approach because such a restriction may inadvertently hinder innovation and new services. Any new restrictions should be prospective only, and the formulation and enforcement would need to be carefully considered to avoid unintended consequences and to ensure fairness and transparency for all providers.

74. Eastlink submitted that, rather than restrictions, it could be beneficial for current auditing processes to be expanded to reviewing not just whether numbering resources are being used, but also how (i.e., for voice-based or other services).

75. Iristel disagreed that there should be a restriction on the use of geographic CO codes and numbers for certain services. It submitted that currently, non-geographic numbers are not a useful substitute for geographic numbers because of the lack of interconnection between carriers for non-geographic numbers. It could not see a business case where its wholesale customers would be satisfied using a number that could only be used to connect inside Iristel's network and not to other carriers' numbers.

76. RCCI argued that geographic numbers should be used only for voice and intercarrier SMS services. It submitted that it has undertaken an internal study to maximize the use of non-geographic numbers in order to divert its demand for IoT/machine-to-machine (M2M) numbers away from geographic NPAs. RCCI submitted that all TSPs should be mandated to do the same thing.

77. SaskTel argued that there should be a restriction on the use of geographic CO codes to applications requiring access to the public switched telephone network.

78. TCI argued that geographic numbers and CO codes should be used primarily for (i) services to Canadian end-users, and (ii) services dialable by the public.

Commission's analysis

79. With the implementation of TBP, this decision will automatically supersede any previous Commission decisions that might have required that carriers, including CLECs, had to obtain an entire CO code in each exchange in which they provide service. LECs and wireless carriers will have to review their tariffs and file for approval any necessary revisions in time for the implementation of TBP, and the CLEC Model Tariff will require updating as appropriate. CISC will also need to review guidelines related to numbering administration.

80. With respect to the use of non-geographic numbers for services such as IoT/M2M services, this issue is also being considered in the context of the CSCN's TIF 112.

81. As noted above, several carriers confirmed that they have requested geographic CO codes for services that do not require geographic numbers, thereby contributing to the premature exhaust of geographic NANP resources. While the Commission is encouraged that some carriers are reviewing their practices in this regard, it considers that absent regulatory intervention, many carriers may delay taking proactive steps to mitigate against number exhaust if it is inconvenient for them. The Commission therefore considers that it must address the use of geographic numbers for services that may not require them.

82. With respect to Iristel's submission that currently, non-geographic numbers are not a useful substitute for geographic numbers because of the lack of interconnection between carriers for non-geographic numbers, this issue is addressed in the next section.

83. To help preserve the limited inventory of geographic CO codes, the Commission determines that, effective the date of this decision, geographic NANP numbers are to be used only for services that require geographic NANP numbers. This includes any previously assigned geographic NANP numbers that are reclaimed or returned to the number pooling inventory.

84. The Commission also considers that carriers should conduct an internal study aimed at decreasing their reliance on geographic NANP numbers where they are not needed.

85. In light of the above, the Commission determines the following:

- effective the date of TBP implementation, LECs are not required to obtain a CO code in every exchange in which they offer local service, and wireless carriers are not required to obtain a CO code per local calling area; and

- effective the date of this decision, carriers and TSPs are to use newly assigned geographic NANP numbers only for services that require

geographic NANP numbers, including any previously assigned geographic NANP numbers that are reclaimed or returned to the number pooling inventory.

86. Further, the Commission **directs**

- the CNA, starting by **6 March 2024**, to require an attestation from applicants requesting geographic NANP numbers and their authorized representatives that (i) the newly assigned numbers will be used only for services that require geographic NANP numbers, (ii) resources other than NANP geographic resources (such as non-geographic numbers or dummy numbers) cannot be used instead, and (iii) the carrier does not have unused numbering resources from previous assignments that can be used instead;

- all Canadian carriers that requested geographic NANP numbers in the 12-month period before the date of this decision to file with the Commission, by **5 April 2024**, an internal study aimed at examining and eliminating their reliance on geographic NANP numbers where such resources are not needed (i.e., where other resources could be used, such as non-geographic NANP resources or an alternative numbering scheme). The study is to include confirmation of whether they obtain numbers to support IoT/M2M services and, if so, to identify which types of numbers they are using for these services; and

- LECs and wireless carriers to file any required tariff revisions at least **four months** prior to TBP implementation.

87. The Commission also requests that CISC undertake a review of the relevant guidelines to determine what changes may be required for the implementation of this new policy regarding using geographic NANP numbers only where required.

What other measures are needed to support an efficient use of numbers?

Positions of parties

88. Iristel submitted that the Commission should move towards making IP interconnection for local number interconnections mandatory and reducing the number of exchanges. In Iristel's view, with an increasing majority of end-users now benefitting from unlimited Canada-wide long-distance plans, the need for multiple exchanges to establish local service areas for the purpose of billing long-distance calls is becoming obsolete. Iristel submitted that the Commission should encourage providers to modernize their networks to IP technology, since this will bring greater efficiency to many aspects of the industry, one of which is number allocation.

89. QMI also suggested, at a time when the concept of long-distance calls is increasingly being abandoned in favour of national calling plans, that the Commission consider allowing the expansion of local interconnection regions (LIRs) in Canada. This would allow for a better distribution of numbers, particularly in areas of lower

population density where some blocks of 10,000 numbers are significantly underused.

90. CNAC, however, submitted that LIR expansion and exchange consolidation would have a limited impact on preserving CO codes and numbers given the number of TSPs currently operating within the existing LIRs. This is because these TSPs were already issued CO codes based on the existing system in place, and because there are fewer new entrants.

91. Iristel further submitted that the Commission should look at the rules for non-geographic numbers. Iristel noted that it is currently not possible to send calls or SMS messages from and to non-geographic numbers belonging to different providers. The company indicated that carriers do not interconnect for the purpose of exchanging traffic that originates from non-geographic codes. Iristel submitted that if the Commission were to mandate interconnection for non-geographic codes for voice and SMS purposes, this would provide Canada with millions of additional numbers that could be used for such services. Iristel added that it has attempted to get the collaboration of other providers to begin the process of interconnection for non-geographic numbers but has seen no interest.

92. In response to an RFI regarding mandating interconnection for non-geographic numbers, Bell Canada submitted that technically, SMS messages can be sent to and from non-geographic numbers belonging to different providers. Voice calls, however, will not work because geographic numbers are required to determine rates for voice calls. Bell Canada added that data roaming can also work with non-geographic numbers because it does not directly use telephone numbers, whether geographic or non-geographic, but rather is done on the basis of the International Mobile Subscriber Identity number pursuant to applicable roaming agreements between carriers. Bell Canada argued that the Commission should not consider mandating interconnection for non-geographic numbers at this time. If the benefits of non-geographic numbers are seen as too limited, they should instead be released for geographic use.

93. RCCI submitted that wireless service providers should exchange SMS traffic destined to non-geographic numbers, but that these numbers would be for SMS-only traffic. Based on RCCI's experience, SMS traffic destined to non-geographic numbers can be exchanged between wireless service providers via the existing SMS Clearinghouse. RCCI was not aware of any technical limitations. RCCI also submitted that the Commission should mandate interconnections for non-geographic numbers, which would help slow number exhaust by allowing TSPs to provide non-geographic numbers to consumers with SMS-only plans and to IoT/M2M devices.

Commission's analysis

94. With respect to the expansion of LIRs, in Telecom Regulatory Policy 2012-24, the Commission addressed various proposals in relation to consolidating LIRs, noting that the overall process that established the current LIRs involved a detailed review

over a period of five years.[11] The Commission considers that while pursuing LIR expansion and exchange consolidation at the systemic level would likely be very beneficial for number preservation, it would be an enormous undertaking engaging telecommunications industry and Commission resources over several years, beyond the window of opportunity to act to remedy number exhaust. However, the Commission notes that in Telecom Decision 2016-345, a special location porting zone was established within the Metro Vancouver area. The Commission encourages the industry, working within CISC, to identify further opportunities for LIR expansion or exchange consolidation that would significantly benefit number preservation.

95. With respect to interconnection between carriers for the exchange of traffic to and from non-geographic numbers, the Commission considers that mandating interconnection for the limited purposes described by Bell Canada and RCCI (e.g., SMS, IoT/M2M, and data roaming) would help slow geographic number exhaust by allowing TSPs to provide non-geographic numbers to consumers for these services.

96. With respect to more broadly mandating IP interconnection, this issue is outside the scope of this proceeding, since it would require a distinct, larger consultation. In the meantime, the Commission has a set of principles in place, set out in Telecom Regulatory Policy 2012-24, to facilitate IP voice network interconnections between network operators while allowing market forces to shape the details of the arrangements.

97. In view of the above, the Commission **directs** all carriers, upon receipt of a bona fide request from another carrier, to enter forthwith into interconnection arrangements for the purpose of exchanging SMS and other data traffic to and from non-geographic numbers. While the details and timelines are left to be negotiated between carriers, the Commission's informal dispute resolution process outlined in Broadcasting and Telecom Information Bulletin 2019-184 is available, as necessary. Further, CISC working groups are available to carriers to help establish any related standards or procedures.

98. In addition, the Commission requests that CISC assess and report, by **5 November 2024**, on further opportunities for LIR expansion or exchange consolidation across Canada with the potential to significantly benefit number preservation. The report should provide all relevant details including appropriate next steps and timelines in light of TBP implementation.

Conclusion

99. In light of the above, the Commission finds that TBP is necessary to slow number exhaust in Canada. Accordingly, the Commission **directs** LECs and wireless carriers to implement TBP by **6 October 2025**. This direction applies to all exchanges where

[11] See Public Notice 2001-126, and Telecom Decisions 2004-46 and 2006-35.

number portability has been implemented, for new telephone number assignments from geographic NPAs.

100. Where number portability is not in place as of 6 October 2025, TBP is to be implemented on the same day that number portability is implemented.

101. Further, LECs and wireless carriers are to file any required tariff revisions to reflect the determinations in this decision at least **four months** prior to TBP implementation.

102. As of the date of this decision, newly assigned geographic NANP numbers, including any such numbers returned to the number pooling inventory, are to be used only for services that require geographic NANP numbers.

103. The Commission also **directs** all Canadian carriers that requested geographic NANP numbers in the 12-month period before the date of this decision to file with the Commission, by **5 April 2024**, an internal study aimed at examining and eliminating their reliance on geographic NANP numbers where such resources are not needed. The study is to include confirmation of whether the carrier obtains numbers to support IoT/M2M services and, if so, to identify which types of numbers are used for these services.

104. In addition, the Commission **directs** the CNA to

- assume the role and functions of the TBP administrator; and
- require, starting by **6 March 2024**, that applicants requesting geographic NANP numbers and their authorized representatives submit an attestation as described in paragraph 86 above.

105. The Commission also **directs** the CLNPC to make any required modifications to the NPAC Service Management System.

106. Further, the Commission **directs** CNAC to

- make the required changes to its service agreement with the CNA; and
- file with the Commission, by **5 April 2024**, a Part 1 application as described in paragraph 37 above.

107. Finally, the Commission requests that CISC

- monitor the implementation of TBP and file quarterly progress reports with the Commission as described in paragraph 31 above;
- provide recommendations to the Commission on strengthening the number assignment guidelines, as described in paragraphs 51 and 52 above, by **6 May 2024**;

- file a report with the Commission, by **6 August 2024**, examining the inclusion of unused numbers from previously assigned CO codes to the number pooling inventory, as described in paragraphs 66 and 67 above; and

- file a report with the Commission, by **5 November 2024**, on further opportunities for LIR expansion or exchange consolidation across Canada with the potential to significantly benefit number preservation, as described in paragraph 98 above.

108. The Commission's determinations in this decision will ensure that Canada's remaining inventory of telephone numbers is managed responsibly, to the benefit of all Canadians who rely on telecommunications as an essential part of their everyday lives.

Secretary General

Related documents

- *Call for comments – Implementing thousand-block pooling, Telecom Notice of* Consultation CRTC 2023-92, 23 March 2023; as amended by Telecom Notices of Consultation CRTC 2023-92-1, 27 March 2023; and 2023-92-2, 18 April 2023

- *Practices and procedures for dispute resolution*, Broadcasting and Telecom Information Bulletin CRTC 2019-184, 29 May 2019

- *TELUS Communications Company – Application to establish a special location porting zone within the Metro Vancouver area*, Telecom Decision CRTC 2016-345, 26 August 2016

- *Network interconnection for voice services*, Telecom Regulatory Policy CRTC 2012-24, 19 January 2012

- *Rogers Wireless Partnership Part VII application regarding the requirement for a central office code in each served exchange*, Telecom Decision CRTC 2007-23, 12 April 2007

- *Follow-up to* Trunking arrangements for the interchange of traffic and the point of interconnection between local exchange carriers, *Telecom Decision CRTC 2004-46*, Telecom Decision CRTC 2006-35, 29 May 2006

- *Trunking arrangements for the interchange of traffic and the point of interconnection between local exchange carriers*, Telecom Decision CRTC 2004-46, 14 July 2004

- *Trunking arrangements for the interchange of traffic and the point of interconnection between local exchange carriers*, Public Notice CRTC 2001-126, 19 December 2001

- *Local competition*, Telecom Decision CRTC 97-8, 1 May 1997