



AUSTRALIAN COMMUNICATIONS INDUSTRY FORUM

**SPECIFICATION**

**LOCAL NUMBER PORTABILITY - NETWORK PLAN**

ACIF G520:2005



Local Number Portability – Network Plan

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## 1. Participants

The ACIF Working Committee that developed the first and second editions of the LNP Network Plan consisted of the following companies and representatives:

| <b>Representative</b>    | <b>Organisation</b>                          |
|--------------------------|--|
| Mike Elsegood (Chairman) | Cable & Wireless Optus                       |
| Robert Tozer             | AAPT   |
| Ken Bell                 | Australian Communications Authority          |
| Osmond Borthwick         | Australian Competition & Consumer Commission |
| Justin Pakes             | Alcatel Australia                            |
| John Pack                | Australian Telecommunications Users Group    |
| James Dam                | Cable & Wireless Optus                       |
| Michael Ranjel           | Ericsson Australia                           |
| Bob Emanuel              | MCI Worldcom                                 |
| Peter Hull               | Nortel Networks                              |
| Brian Ross               | Nortel Networks                              |
| Nigel Lee                | Primus Telecommunications                    |
| Roger Nicoll             | Primus Telecommunications                    |
| Gary McLaren             | Siemens Australia                            |
| Yasmin Dugan             | Telstra Corporation                          |
| Sam Fois                 | Telstra Corporation                          |
| David Bridge             | Vodafone Network                             |

James Duck of ACIF provided project management support.

This document was revised by the Network Reference Panel in 2004 to create the third edition.





## 2. Introduction

### 2.1 Number Portability for Local Numbers

- 2.1.1 Number portability for local numbers i.e. geographic numbers used to provide a local service, was implemented in Australia during May 1998, in accordance with the *ACA Telecommunications Numbering Plan 1997*, the ACCC's directions to the ACA and the implementation date for initial implementation set by the ACA. This third edition of the LNP Network Plan describes networking arrangements consistent with requirements in the *ACA Telecommunications Numbering Plan 1997* plus amendments and variations and the implementation of Local Number Portability (LNP) across multiple local access networks.
- 2.1.2 This third edition of the Network Plan incorporates changes consistent with the ACIF C540:2003 Local Number Portability Industry Code, and contains sections that describe network actions associated with the porting processes that are defined in ACIF C540:2003. The Network Plan also describes network actions that assume network operators can access information on ported numbers and the networks they are connected to.
- 2.1.3 With the advent of LNP there is a change to the traditional ways calls are delivered to terminating access networks from originating access networks, long distance, mobile, international and other networks. This document details these networking arrangements.
- 2.1.4 This plan is predicated on the understanding that the ACA's current practice of allocating blocks of geographic numbers to carriers and carriage service providers will continue.
- 2.1.5 This plan defines the industry agreed call handling and technical interconnection arrangements based on a model of interconnected networks. The model of interconnected networks is derived from AUSTEL's Interconnection Model of March 1995. This Model has been updated a number of times since 1995 and the current version used for reference in development of this Network Plan is ACIF G538:1999 ACIF Interconnection Model.
- 2.1.6 This plan is written to be consistent with ACIF G500:2000, ACIF G500:2002, ACIF G549:2000 and ACIF G549:2002.

### 2.2 Industry Structure

- 2.2.1 The supply of local access services is currently undertaken by a number of carriers in Australia. In addition, new carriers and carriage service providers are able to establish their own networks for local access services or they may choose to resell the services of a network operator. Under the Telecommunications Act 1997, additional carriers and carriage service providers may enter the market and may obtain interconnection with the same level of technical functionality as other networks.
- 2.2.2 This plan for the implementation of number portability for local numbers takes account of the future market place. The plan applies to the following service deliverer categories: Originating Access Service Deliverer (OASD), Terminating Access Service Deliverer (TASD), Transit Service Deliverer (TSD), Contracted Transit Service Deliverer (CTrSD) and Prime Service Deliverer (PSD).

### 2.3 Role of this Plan

- 2.3.1 The *ACA Telecommunications Numbering Plan 1997* defined number portability responsibilities for carriage service providers. ACIF developed ACIF C540:2003

Local Number Portability Industry Code which details the industry agreed procedures and practices to be followed for supporting local number portability.

- 2.3.2 This Network Plan was developed by ACIF's Network Reference Panel and defines the industry agreed call handling requirements for calls between interconnected networks in a number portability environment. The document also provides a description of various solutions that could be used for providing local number portability in Australia.

## **2.4 Related ACIF Work**

- 2.4.1 Porting processes for LNP are defined in a separate document ACIF C540:2003 Local Number Portability Industry Code.

## **2.5 Abbreviations**

- ACA - Australian Communications Authority
- ACCC - Australian Competition and Consumer Commission
- ACIF - Australian Communications Industry Forum
- C/CSP - Carrier/Carriage Service Provider
- CLI - refers to the Calling Line Identification number of the calling ('A') party.
- CP - CLI passed across the POI boundary
- DCC - Directly Connected Customer
- DP - Digits passed across the POI boundary
- CTrSD - Contracted Transit Service Deliverer
- IN - Intelligent Network
- LNP - Local Number Portability
- LS - Local Switch
- MSC - Mobile Switching Centre
- NSN - refers to the National Significant Number, for example, of the called party, typically in the form of X XXXX XXXX, e.g. 2 9464 8435.
- OASD - Originating Access Service Deliverer
- POI - Point of Interconnection
- PS - Pre-selected call
- PSD - Prime Service Deliverer
- RVA - Recorded Voice Announcement
- TASD - Terminating Access Service Deliverer
- TrSD - Transit Service Deliverer
- TS - Tandem Switch (Intra-network and Interconnect)

## **2.6 Definitions**

See ACIF C540:2003 Local Number Portability Industry Code for definitions.

## 2.7 References

ACA Telecommunications Numbering Plan 1997 plus Amendments and Variations  
ACA's Equivalent Service Criteria and Assessment for Local Number Portability  
November 2002

ACIF G538:1999 ACIF Interconnection Model

ACIF C540:2003 Local Number Portability Industry Code

ACIF G500:2000 Signalling System No.7 - Interconnect ISUP Industry Specification

ACIF G500:2002 Interconnection Signalling Specification for Circuit Switched  
Networks Industry Specification

ACIF G549:2000 Interconnection Implementation Plan Industry Specification

ACIF G549:2002 Interconnection Implementation Industry Guideline

AUSTEL Interconnection Model (Multi-Service Deliverer Environment) Final Report  
March 1995



### 3. Network Model

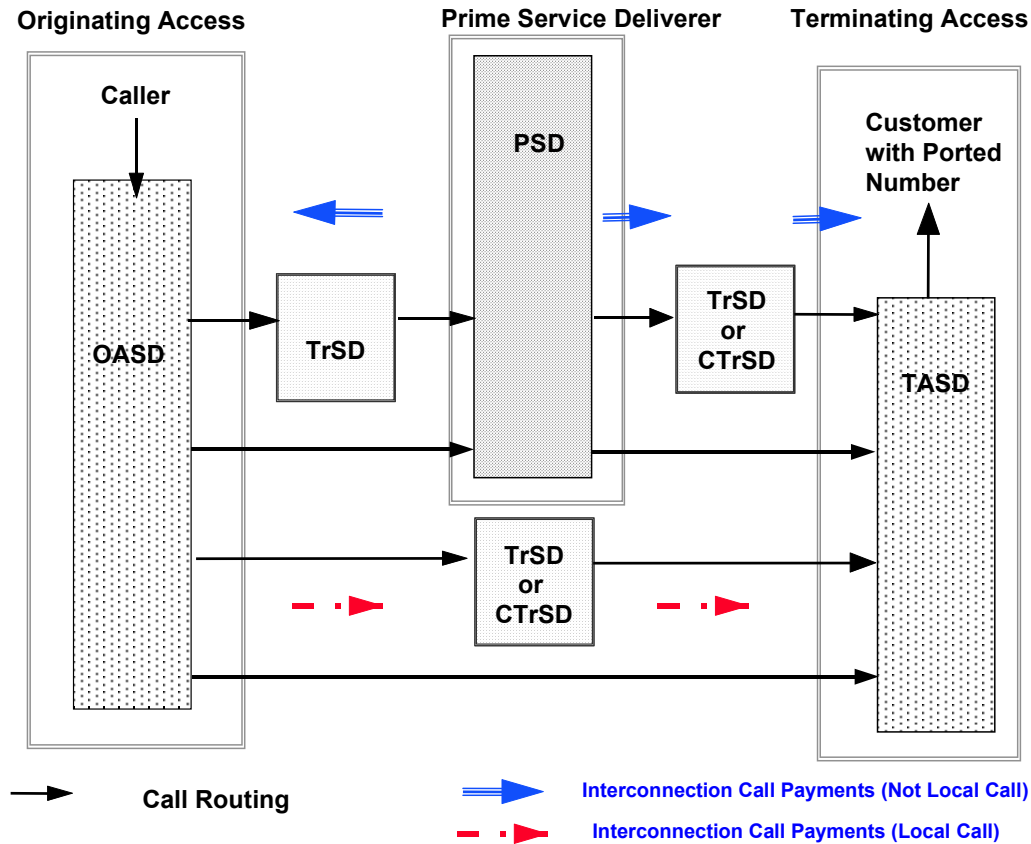
#### 3.1 Overview

- 3.1.1 AUSTEL's Interconnection Model (Multi-Service Deliverer Environment) Final Report March 1995 and its successor ACIF G538:1999 ACIF Interconnection Model identify in general terms the various networks that may be involved in the establishment of a connection across multiple networks operating in a competitive environment. The Models identify the roles of those networks in maintaining the ability of any customer to call any other customer, irrespective of who provides the access networks of the calling and called customers and any intervening networks.
- 3.1.2 The provision of public switched telephony and data services in a competitive environment will generically involve the calling customer, who may be directly connected to various originating access networks, fixed or mobile, and the called customer, for example, a customer with a geographic number connected to a terminating access network. The number of the called customer may be a number allocated to the terminating access service deliverer or it may be a number ported from another carrier or carriage service provider.
- 3.1.3 A call may be switched from an access network via other carrier or carriage service provider networks, eg, a long distance network, in which case it is that carrier or carriage service provider, acting as a Prime Service Deliverer who requires terminating access. For local calls, the Access Service Deliverer will also be the Prime Service Deliverer who requires Terminating Access to complete calls to the customer with the ported number.
- 3.1.4 This network plan for number portability for local numbers has been developed with separate reference to Access and Prime Service Deliverers to take account of the potential separation of Access and Prime Service Deliverer functions in an open competitive environment.
- 3.1.5 For the purposes of this plan it has been assumed that the service deliverer assigned a particular responsibility under the ACIF Interconnection Model provides the network infrastructure to fulfill that responsibility.

#### 3.2 Types of Service Deliverers

- 3.2.1 The following definitions are applicable to the types of Service Deliverers that may operate in a portable local number environment. Their relationships are shown in Figure 3.1 below.

**Local Number Portability - Interconnection Arrangements**



**Figure 3.1**  
**Service Deliverers' Relationships**

**PSD - Prime Service Deliverer**

3.2.2 The PSD has a contractual relationship with the customer for the provision of a carriage service, eg, a long distance call or a local call. The PSD is responsible for ensuring the delivery of the service levels required by the calling customer. The PSD is responsible for all customer and caller interactions including service assurance and billing, unless agreements have been made with other SDs. If the PSD operates a network, the PSD negotiates interconnection agreements with OASDs, CTrSDs TrSDs and TASDs, as required, to deliver traffic to and from the PSD's network to meet their service requirements. The PSD is the originating access service deliverer for local calls from the fixed network, the long distance carriage service provider for long distance calls, the originating access service deliverer for calls from mobile networks.

3.2.3 For the purposes of this plan, a carrier in Australia receiving terminating international calls is considered in the same way as a PSD seeking terminating access from a Terminating Access Service Deliverer.

**OASD - Originating Access Service Deliverer**

3.2.4 The OASD provides an access service to connect the A party (the end-user that originates a call) to a PSD for the supply of carriage services or to a terminating access service deliverer. This may be undertaken directly or through a TrSD. Part of the

access service provided by the OASD would be the determination of the TASD for local calls. This function may be contracted by the OASD to a CTrSD.

#### CTrSD - Contracted Transit Service Deliverer

- 3.2.5 An OASD or PSD may contract with the CTrSD to determine, on its behalf, the TASD for calls to portable local number ranges. The CTrSD then delivers the call to the TASD directly or through a TrSD. (Note the use of the term “Contracted” is consistent with the Interconnection Model but in this case limited to the SDs mentioned.)

#### TASD - Terminating Access Service Deliverer

- 3.2.6 The TASD through its interconnection agreement with an OASD, CTrSD, TrSD or PSD provides them with an access service to the B party.

#### TrSD - Transit Service Deliverer

- 3.2.7 A TrSD is contracted through an interconnection agreement to provide a transit service between SDs.

### 3.3 Assumptions

#### Interconnection Payment

- 3.3.1 As number portability in other services and constraints in the signalling system may not allow the identification of all SDs in the call path, it is assumed that interconnection payments will need to be made between adjacent SDs on a call, as the identification of non-adjacent parties may not be workable.

#### Local Number Allocation

- 3.3.2 Numbers will continue to be allocated by the ACA to carriers and carriage service providers in blocks of, for example, 10,000 numbers.

#### Network Solutions

- 3.3.3 This plan was developed from the declared initial implementation plans of Telstra and Optus. Telstra’s implementation requires the trunking of calls to the local switch with the block number allocation. Optus’ implementation is based on the use of Intelligent Network technology. Other solutions for local number portability for longer term application may be considered for inclusion in a subsequent plan. Note that an OASD, CTrSD or PSD may use networking methods of its choice, eg IN, to route calls to the POI. This plan identifies conditions that must be met at Points Of Interconnection. In addition, from 1 January 2000, each network solution will have to meet the ACCC’s equivalent service requirements contained in its Directions to the ACA on 22 September 1997 and supporting criteria for evaluating equivalent service developed by the ACA.

### 3.4 Multiple Porting of Numbers

- 3.4.1 In a multi carrier environment, with number portability, customers must be able to move their number not only to a first alternative network, but to an unlimited number of subsequent networks, depending on the customer’s choice of access network provider.

### 3.5 Network Integrity

- 3.5.1 To prevent circular routing, when a call to a ported number is directed from an OASD/PSD to the network identified as directly connecting the customer, the call must not be passed to another network with the same number for the called customer. The call should be terminated to the called customer (that is, rings the called customer). A Terminating Access Network receiving a call with a ported number service indicator and the customer is not connected to that network is an error condition. If there is an

error condition and the call cannot be correctly terminated, a recorded voice announcement or an appropriate tone should be applied. Note that the call may be forwarded or transferred to another number as controlled by the called party.

### **3.6 Numbering Plan Responsibilities**

3.6.1 Chapter 11 of the ACA Telecommunications Numbering Plan 1997, dated 31 December 1997, sets out the rules about portability which carriage service providers must follow. The following key points should be noted.

- (a) all carriage service providers holding portable numbers must provide number portability after the date advised by the ACA,
- (b) geographic numbers are allocated in blocks of either 1000 (non metro areas) or 10000 (metro areas),
- (c) geographic service numbers are currently not pooled,
- (d) carriage service providers that are portable number holders must keep a register of any carriage service provider which ports a number and make this register available to other carriage service providers (see the following paragraphs from the ACA Telecommunications Numbering Plan 1997).
- (e) routing responsibilities for portable calls are defined (see the following paragraphs from the ACA Telecommunications Numbering Plan 1997).

#### **“11.13 Routing arrangements**

- (1) *The responsibilities in subsections (2) and (3) are the routing responsibilities.*  
*Note: Subsections (4) to (7) explain which carriage service provider has the routing responsibilities.*
- (2) On and after the implementation date for a portable number, the carriage service provider must enable call completion to the portable number by:
  - (a) *routing the call appropriately; or*
  - (b) *ensuring correct routing of the call to the appropriate carriage service provider of calls to the number.*
- (3) The originating access carriage service provider has the routing responsibilities unless one of subsections (5) to (8) *[should be (4) to (7)]* applies.
- (4) If pre-selection of a carriage service provider, or use of a pre-selection over-ride code, has been applied to a call, the calling party’s pre-selected carriage service provider has the routing responsibilities.
- (5) If a call to a portable number is an incoming call originating outside Australia, the first carriage service provider in Australia receiving the incoming overseas call to the number has the routing responsibilities.
- (6) If a call involves number translation from the dialled number to the appropriate network address to enable correct routing (eg. for numbers used in connection with the supply of freephone or local rate services), the carriage service provider providing the translation service has the routing responsibilities.
- (7) If a call is being diverted from a number to another, the carriage service provider providing the diversion service has the routing responsibilities.”

#### **“11.22 Carriage service provider’s management of portable numbers**

- (1) A carriage service provider that holds a portable number must comply with this section.
- (2) The carriage service provider must:
  - (a) *make and keep a register of the carriage service providers to which numbers have been allocated or transferred after the relevant implementation dates for the numbers; and*
  - (b) *make the register available for inspection by other carriage service providers.*
- (3) The register must identify:
  - (a) *the portable number; and*
  - (b) *the carriage service provider to which the number has been allocated or transferred.*
- (4) The carriage service provider may enter into an agreement or other arrangement with other carriage service providers to make and keep the register mentioned in subsection (2).”



## 4. Call Handling

### 4.1 Description of the solution for portability of local numbers.

4.1.1 The *ACA Telecommunications Numbering Plan 1997* requires the carriage service provider keep the following information for each ported number within its allocated block:

- (a) if the number is ported , and
- (b) the TASD.

The *ACA Telecommunications Numbering Plan 1997* also defines “routing responsibilities” for calls. If a carriage service provider has routing responsibilities for a call it can either:

- 1. route the call to the TASD, if it has this knowledge, or if not
- 2. route the call to another SD which it has contracted to perform its routing responsibilities. This “contracted” SD may be the SD holding the block number allocation for the number called. The “contracted” SD also will also perform a transit function as calls are switched into and out of its network. In this Plan the term Contracted Transit Service Deliverer is therefore used.

4.1.2 In this way the actual TASD for any call is determined. The solution also contains trunking rules and call service indicators which ensure against misrouting of calls. The logic diagrams associated with this solution are given in Figures 4.1, 4.2, 4.3, 4.4 and 4.5. Under conditions defined in Section 5.3.9, calls may be directed via the Donor network, as a fallback, to ensure that all calls can reach the called customer.

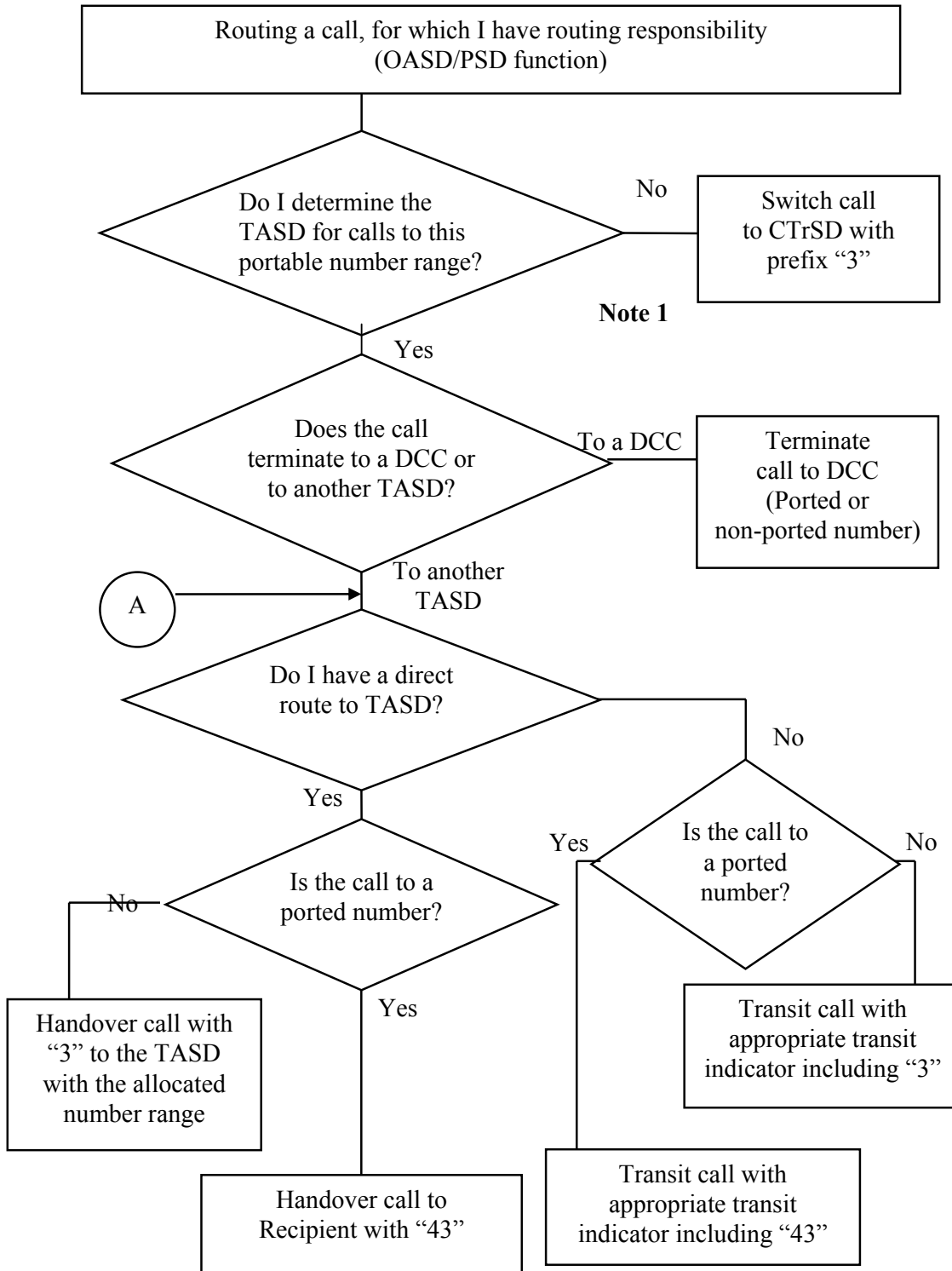
Figure 4.1 shows the routing options available to a SD if it has “routing responsibility” for a call.

Figure 4.2 shows the routing options available to a SD receiving a call with a “Call to ported number” service indicator set. This indicates that the SD passing the call has determined, from information available to it, the recipient to be the TASD.

Figure 4.3 shows the routing options available to a SD receiving a call with a “general” service indicator set. This indicates that the SD passing the call has determined, from information available to it, the carrier with the allocated number block to be the TASD. Note that if a Donor network receives a call to a geographic number that has ported off its network, and the call is received with the general termination indicator set (3), then the Donor should, at least during an interim period after porting, route the call to the correct TASD.

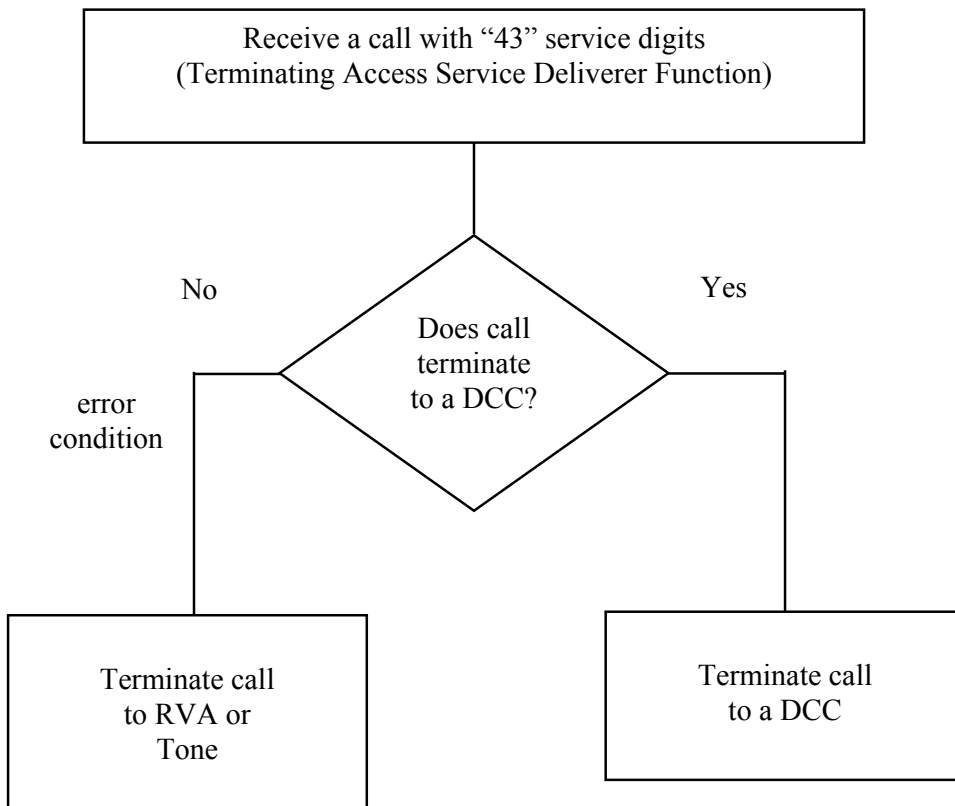
Figure 4.4 shows the routing options available to a SD receiving a call with a general “termination” service indicator set. In this case, the SD passing the call has contracted out its routing responsibilities in relation to the call. The SD receiving the call is the Contracted Transit Service Deliverer. It determines the correct TASD for the call and switches the call to that TASD directly or via a Transit SD.

Figure 4.5 shows the routing options available to a Transit SD providing connectivity between networks.



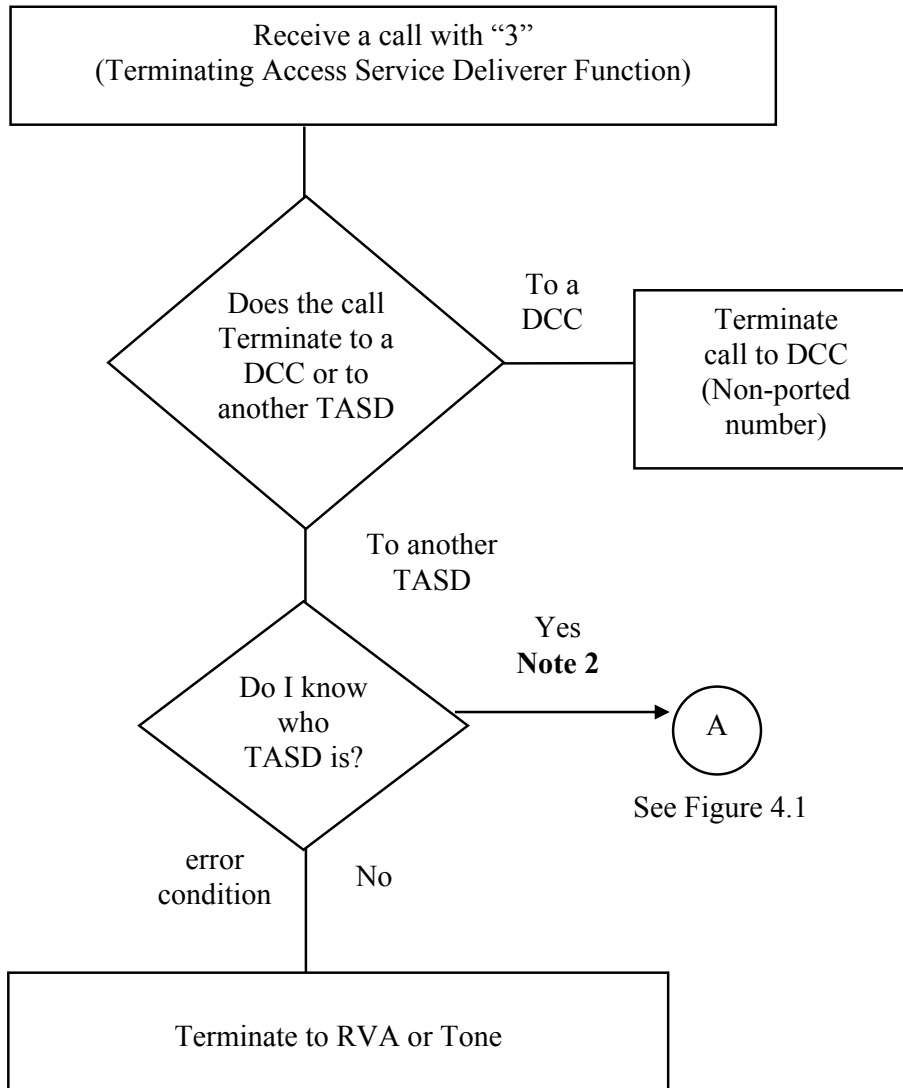
**Note 1** Commercial Agreement required with CTrSD

**Figure 4.1**  
Routing options for network with routing responsibility.



**Figure 4.2**

Routing options with "Call to ported number" service indicator set.

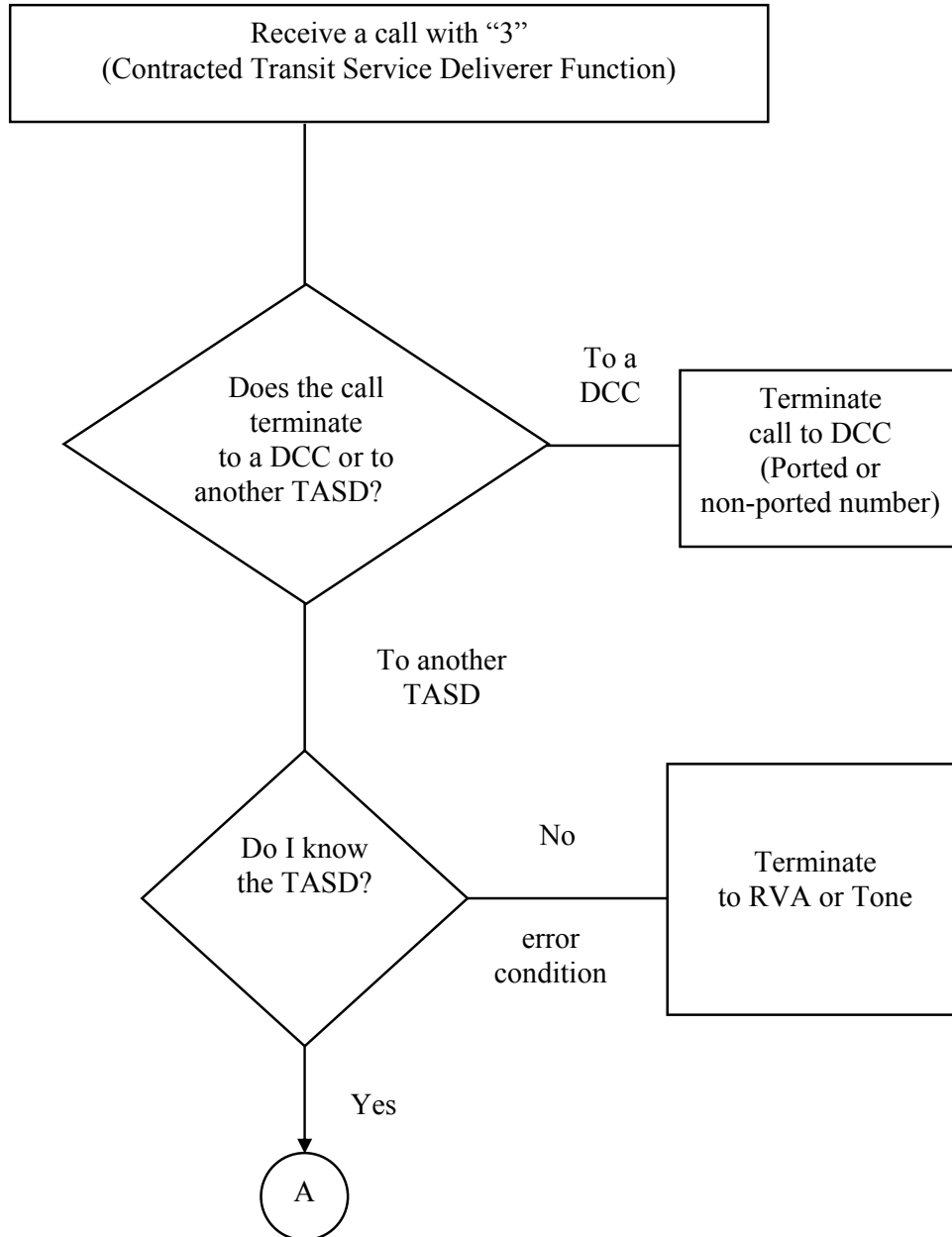


**Note 2**

May occur during porting of customers, but only allowed for short period until networks update information.

**Figure 4.3**

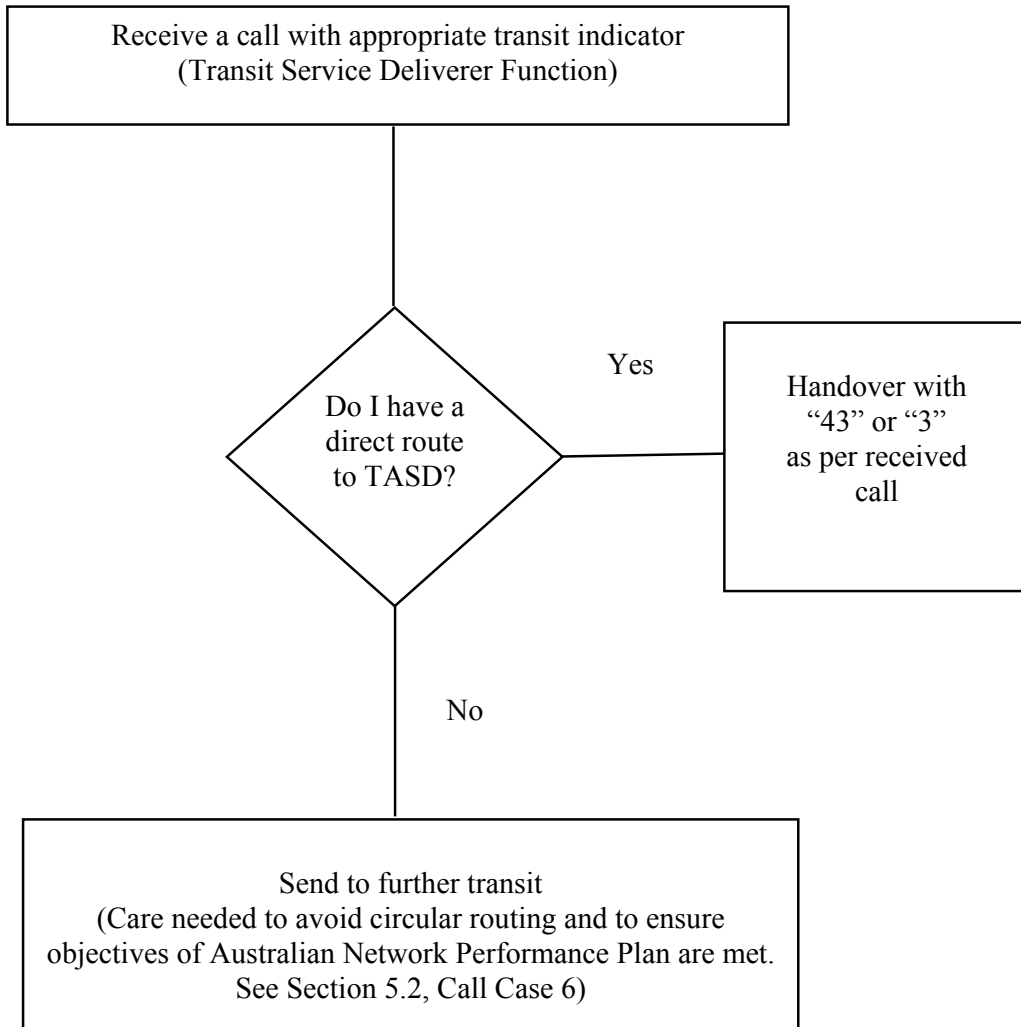
Routing options with a general “termination” service indicator set for calls to the TASD with the allocated number range.



See Figure 4.1

**Figure 4.4**

**Routing options for the Contracted Transit Service Deliverer (Selection of correct TASD)**



**Figure 4.5**  
Routing performed by a Transit Service Deliverer (Connectivity between networks)

## 4.2 PSD

- 4.2.1 The PSD is responsible for ensuring delivery of a call to the TASD of the called customer. The PSD may contract this responsibility to a CTrSD.
- 4.2.2 For local calls from the fixed network and mobile originated calls, the OASD also performs the PSD role, in that the OASD also bills the customer, provides features etc.
- 4.2.3 For calls that involve the pre-selection of a carriage service provider, or use of a pre-selection over-ride code, the calling party's pre-selected carriage service provider is the PSD and has the routing responsibilities to direct the call to the correct TASD.

## 4.3 OASD

- 4.3.1 The directly connected customers of an OASD will inevitably make local calls to other geographic numbers, ported and non-ported. The OASD must ensure that any such calls are delivered to the correct TASD. The OASD may contract this function to a CTrSD.

## 4.4 CTrSD

- 4.4.1 When the CTrSD receives a call from an OASD, PSD or TrSD without an indication of the TASD, the CTrSD will determine the TASD for the call and ensure delivery of the call to a POI with the TASD, either directly or through a transit network.

## 4.5 TASD

- 4.5.1 The number dialled by a calling customer for the termination of calls could be issued to a customer directly connected to any TASD. The TASD should terminate calls received directly from an OASD or PSD, or via a transit network, in the much same way as other calls. Calls to ported numbers on the TASD's network that are identified as such at the Point of Interconnection must be terminated correctly or if there is an error condition terminated to a RVA. These calls cannot be switched to another network.

## 4.6 Transit Network Operator

- 4.6.1 A transit network may be used on any leg of a call between the OASD and the TASD. The OASD, CTrSD or PSD must have a contract with the transit network for the delivery of such calls.

In particular, a transit network may be used on the terminating section of a call from an OASD, CTrSD or PSD to provide links to a TASD. The PSD must have a contract with the transit network for the delivery of such calls to the TASD. The transit network operator would be advised of the TASD for the call, and would deliver the call based on that information.

## 4.7 Identification of Correct TASD

- 4.7.1 A PSD or OASD requiring terminating access from a TASD has at least three options for meeting its obligations to direct calls to the correct TASD -
  - (a) Determine the TASD for calls using its own network resources and deliver calls to a Point of Interconnection with the TASD.
  - (b) Determine the TASD for calls using its own network resources and deliver calls to the TASD via a transit network.
  - (c) Contract with another network operator, the CTrSD, and deliver calls to the CTrSD, directly or via a transit network.

## **4.8 Information on Ported numbers**

- 4.8.1 The Plan assumes information on ported numbers and the identity of the T ASD for a particular number are available to all network operators with routing responsibilities.
- 4.8.2 Information on ported numbers may not be available immediately to all network operators at the instant a number is ported. There may therefore be a time lag between customer porting and the action at a network level to achieve efficient routing. This will mean that an O ASD, TrSD or PSD that is not the donor network may not be able to route calls to the recipient network at the instant the number is ported and alternative routing arrangements will be required.
- 4.8.3 Donor networks may undertake the CTrSD role for a short period after porting to promote continuity of service to the customer. This provides other networks with time to achieve network rearrangements to direct calls to the correct T ASD.
- 4.8.4 Where a further porting of a number occurs, carriers other than the donor, losing and gaining carrier would need to rearrange their networks quickly or calls to the ported number will be lost. As this is not practically achievable by all networks at this time, the other networks may, with the agreement of the Donor, direct calls through the Donor network for a short period before and after porting. Those networks may then rearrange their networks to direct calls to the gaining carrier using information on ported numbers. See Section 5.4



## 5. INTERCONNECTION FOR PORTABLE LOCAL NUMBERS

This section provides a description of the industry proposed multi-carrier network interconnection prefix structure and its application in local number portability. Interworking between networks is defined below consistent with general interconnection arrangements and the existing ACIF Publications G500:2000, G500:2002, ACIF G549:2000 and ACIF G549:2002. Other means of satisfying interconnection requirements may be defined in future signalling plans and, should that occur, this plan would be reviewed accordingly.

### 5.1 Interconnection Prefix Structure

- 5.1.1 The purpose of the interconnection prefix structure is to allow efficient call routing to the identified service provider and to provide service information to the service provider for the call from the access or other preceding network. (Reference Interconnect Dial Plan.) A network sending a call across a Point of Interconnection must ensure the correct prefix is inserted.
- 5.1.2 A significant consideration in the development of this structure has been the requirements of the customer and network operator billing systems, the capabilities of the existing signalling systems and existing exchange applications as well as providing a clear migration path for potentially new signalling systems and exchange applications.

#### *Network Addressing Structure*

- 5.1.3 The interconnection prefix structure of the Interconnect Dial Plan is currently required on all calls between interconnecting networks that utilise Interconnect ISUP. The structure includes a Carrier Access Code (CAC) and a Service Code (S). The Carrier Access Code is proposed to align directly with the ACA allocated carrier override code.
- 5.1.4 The Service code is proposed to provide explicit customer or network information for billing purposes and to enhance network integrity. The following service codes and meanings have been agreed (see Table 5.1):

| Service Code | Number Length | Meaning   |
|--------------|---------------|---|
| -            | 0             | No service indicator. Override code dialled by the calling party. The Access carrier provides immediate call hand-over to the Interconnecting carrier. Near-end hand-over observed. |
| 9'S'<br>8    | 2-3           | Transit network service.<br>Transit, Originating Access Preselection (instead of '95').   |
| 5            | 1             | Customers preselection choice used. The Access carrier provides immediate call hand-over to the Interconnecting carrier. Near-end hand-over observed.                               |
| 2            | 1             | Customer dials a carrier specific code. The Access carrier provides immediate call hand-over to the Interconnecting carrier. Near-end or agreed hand-over observed.                 |
| 3            | 1             | The Interconnecting carrier requires terminating access from the access carrier. Far-end hand-over observed.  |
| 4'S'         | 2             | Access Service to Portable Numbers of TASD.<br><b>See Note</b>  |

Where : 'S' = Previous service indicator

**Table 5.1**  
**Service Code**

Note for LNP the Service Code “4” indicates that the call is being passed to the TASD. Rerouting of a call received with the network’s own CAC and a service code “4” to another SD using the same called party number is NOT allowed.

For the purpose of calls in a portable local number environment the following interconnection prefix structure and Dial Plan B-Number Address Structure would generally apply (see Table 5.2):

| CAC + S Prefix | B-Number Address Structure | Number Length | Comment   |
|----------------|----------------------------|---------------|---|
| 14XY + 43      | 14XY + 43 + 0 + NSN        | 16            | Terminating Access required to a ported number on network 14XY.   |
| 14XY + 3       | 14XY + 3 + 0 + NSN         | 15            | Terminating Access required to a number on network 14XY. Network 14XY may be allocated the number block that contains the dialled number. Alternatively, network 14XY may be identified as the carrier providing CTrSD functionality. |

Where : X = digit 0 - 9 Y = digit 0 - 9

**Table 5.2**  
**B-Number Address Structure**

**It must also be recognised that the establishment of this interconnection prefix structure does not preclude or replace the requirement of developing an intercarrier service description. For each new interconnection service the service description should explicitly identify the prefix applicable to the service.**

## 5.2 Application of the Interconnection Prefix Structure

5.2.1 A number of call scenarios can be easily supported by the above interconnection prefix structure. For simplicity, six of the most common call cases are drawn below with the appropriate interconnection prefix.

For purposes of illustration in the following figures, please note the following:

B number - refers to a number that has been ported

W number - refers to a number that has not been ported

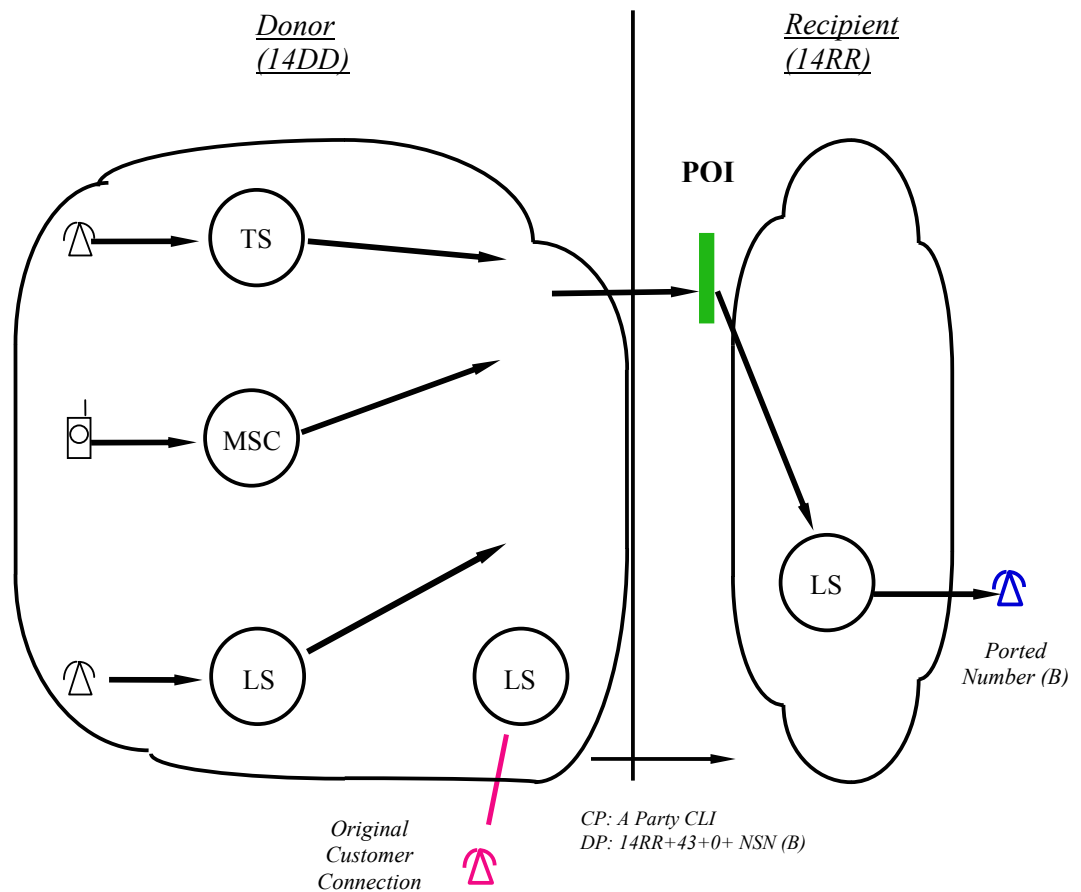
Donor - the Carrier/Carriage Service Provider to which a number is allocated under the *ACA Telecommunications Numbering Plan 1997* and from which a number has been ported. Identified by 14DD in call cases below.

Recipient - the Carrier/Carriage Service Provider to which a number is ported and who is not allocated that number under the *ACA Telecommunications Numbering Plan 1997*. Identified by 14RR in call cases below.

Other networks in the call cases are identified by 14CD.

### Notes on the Call Cases

- (a) Call cases 1, 2, 3 and 4 are consistent with Section 4.7.1 (a).
  - (b) Call case 5 is consistent with Section 4.7.1 (c). From the perspective of the PSD/OASD, Call case 6 is also consistent with Section 4.7.1 (c).
  - (c) Call case 6 also illustrates the potential role of transit networks.
  - (d) Other call cases may also apply that are not illustrated in the following figures.
- 5.2.2 This network plan describes network options consistent with known network capabilities and the routing responsibilities of the *ACA Telecommunications Numbering Plan 1997*.
- 5.2.3 Call cases 5 and 6 show options a PSD or OASD may pursue and require appropriate interconnection agreements.

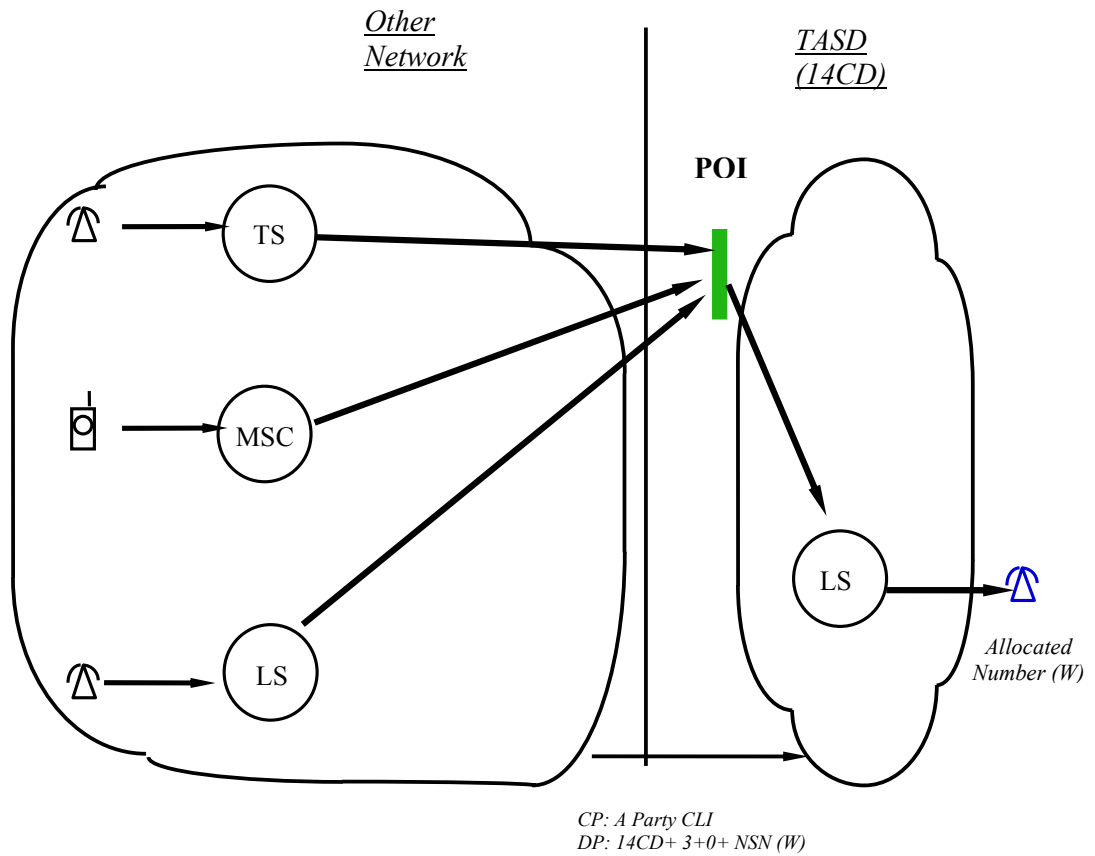


The following arrows apply to all call case diagrams:  
 - indicates the actual call flow

Note 1 – In the recipient network, LS is the local switch that serves the customer with the ported number.

**Figure 5.1**  
**Call Case 1**

Call from Donor DCC to a number ‘B’ ported from Donor to Recipient

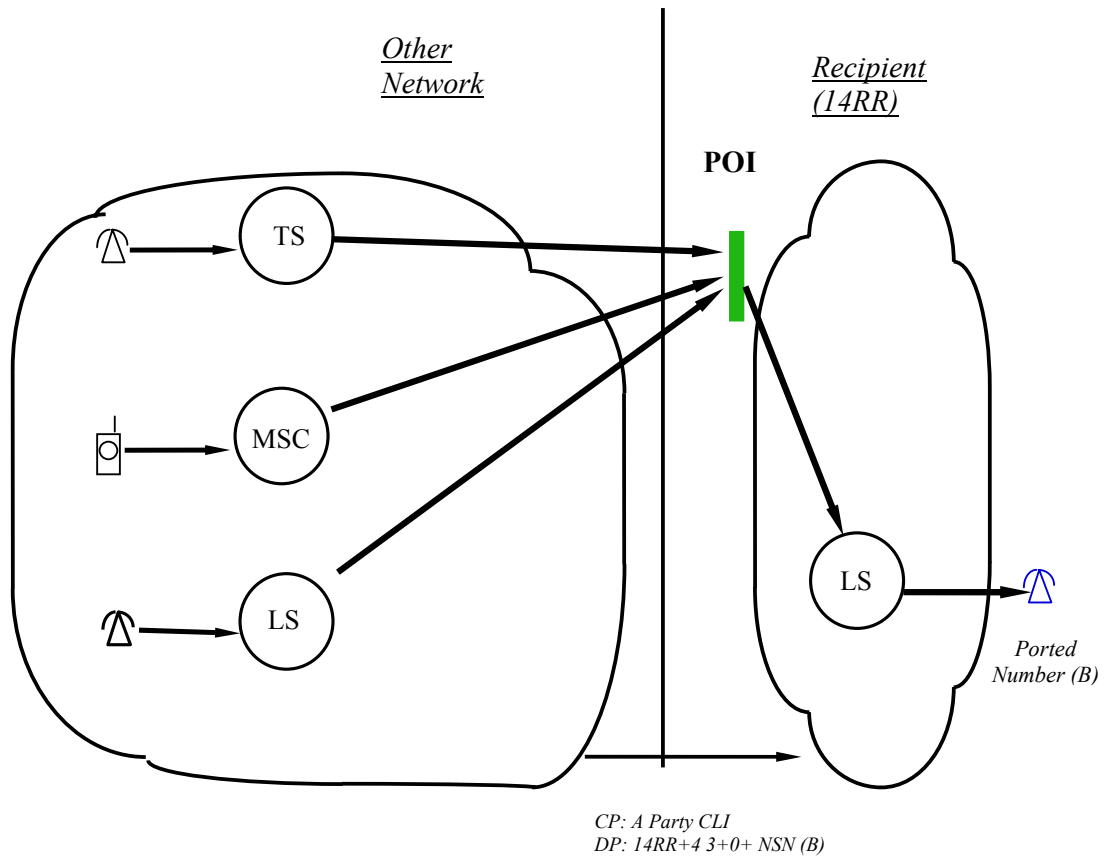


The following arrows apply to all call case diagrams:  
 - indicates the actual call flow

Note 1 – In the recipient network, LS is the local switch that serves the customer with the ported number.

**Figure 5.2**  
**Call Case 2**

Call from another network, i.e. a network that is not donor or recipient, that makes use of information on ported numbers in its call routing, to an number ‘W’, not ported, in the allocated number range of a TASD, 14CD, where the networks are directly connected.



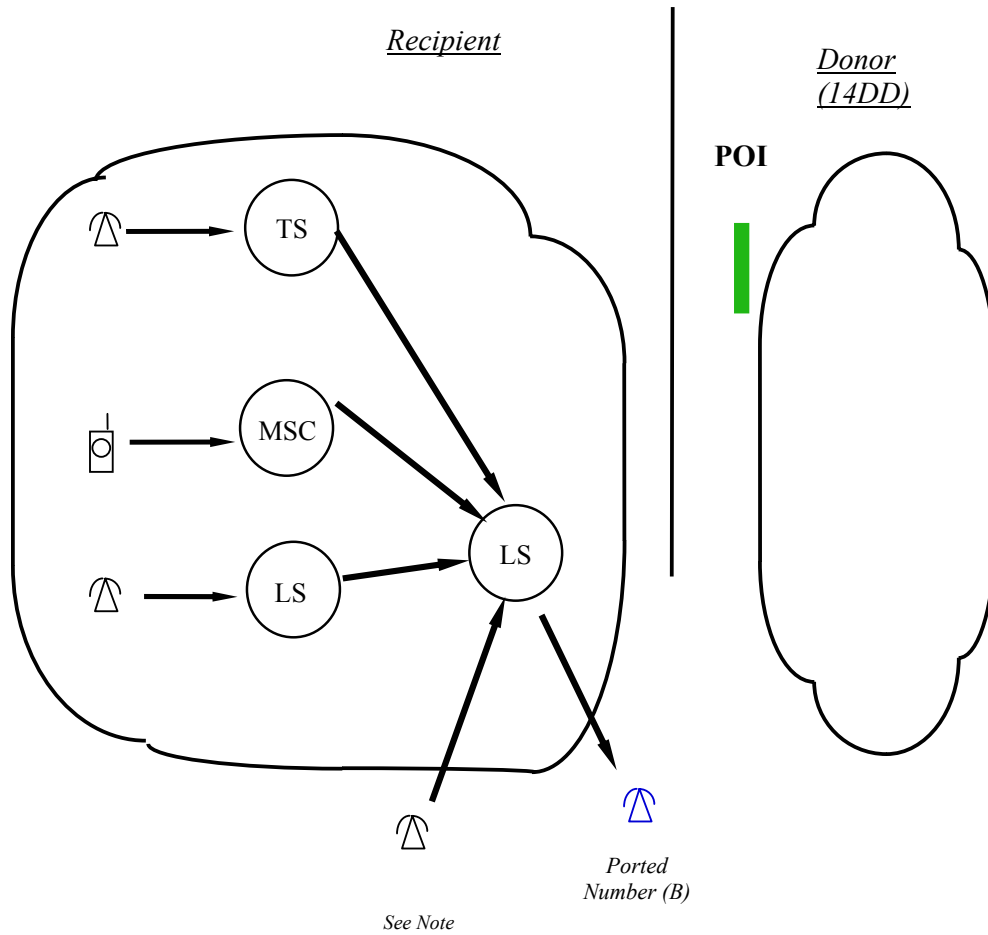
The following arrows apply to all call case diagrams:


- indicates the actual call flow

Note 1 – In the recipient network, LS is the local switch that serves the customer with the ported number.

**Figure 5.3**  
**Call Case 3**

Call from another network, i.e., a network that is not donor or recipient, that makes use of information on ported numbers in its call routing, and the call is to a ported number, B.



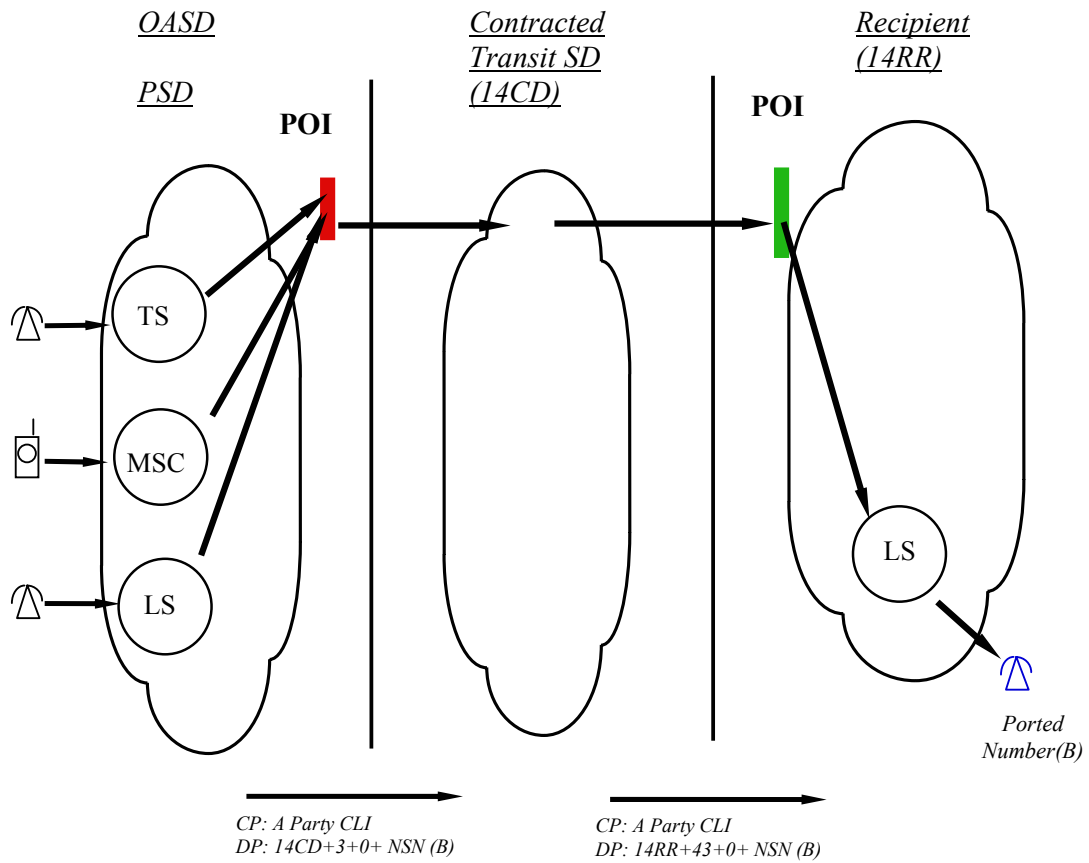
The following arrows apply to all call case diagrams:  
 - indicates the actual call flow

Note 1 – Some care is needed to ensure that a call to a ported number from a customer directly connected to the same LS as the called customer is switched locally. In the above example, the call is switched by the LS and not sent to the Donor network.

Note 2 – In the recipient network, LS is the local switch that serves the customer with the ported number.

#### **Figure 5.4** **Call Case 4**

Call from recipient network to a ported number, 'B', on its own network, using own network capabilities.



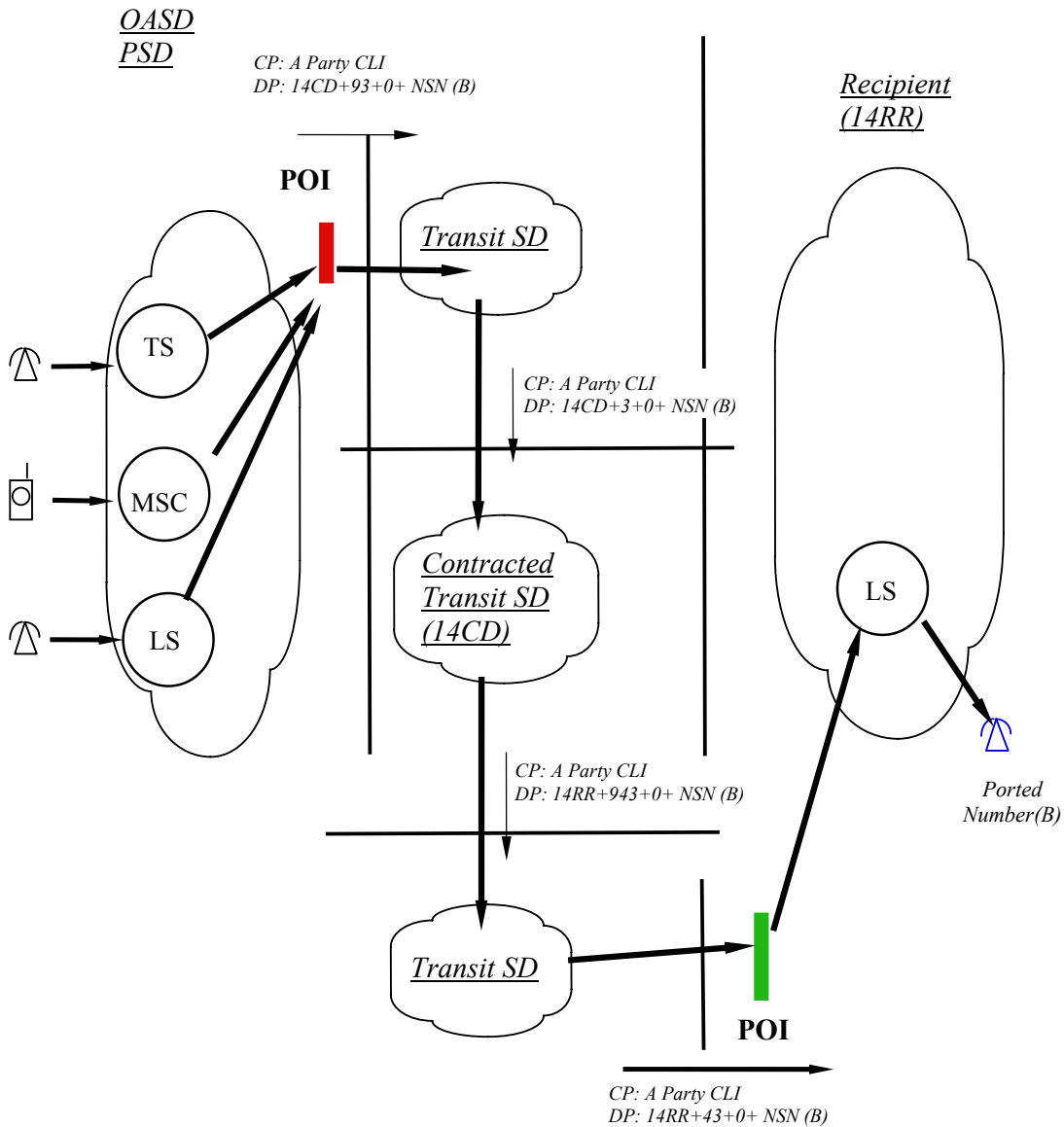
Note 1 – In this case it is possible that the OASD/PSD is also the Recipient

Note 2 – In the recipient network, LS is the local switch that serves the customer with the ported number.

**Figure 5.5**  
**Call Case 5**

Call from other OASD or PSD to a ‘B’ number ported from Donor to Recipient. OASD or PSD relies on Contracted Transit Service Deliver network to route call to Recipient and where the networks are directly connected.





Note 1 – The total number of Transit Service Deliverers needs to be managed to ensure adequate end to end performance of calls. The maximum number of Transit Service Deliverers between OASD or PSD and the TASD is recommended as two, in addition to the Contracted Transit Service Deliverer, as shown above.

Note 2 – The use of Service Indicator ‘9’ for Transit Service Deliverer as shown above may not be used by all Service Deliverers. In such circumstances, an alternative transit indicator may be sent across the POI.

Note 3 – In the recipient network, LS is the local switch that serves the customer with the ported number.

**Figure 5.6**  
**Call Case 6**

Call from other OASD or PSD to a ‘B’ number ported from Donor to Recipient. OASD or PSD relies on Contracted Transit Service Deliver network to route call to Recipient and where networks are not directly connected.

### 5.3 Trunking Rules

#### General

- 5.3.1 To ensure that network integrity is maintained for these types of calls and to avoid the occurrence of circular routing, any interconnection call received with a ported number service indicator “4” must not be switched by the T ASD to any other network with the service indicator “4” and the same B number.
- 5.3.2 A Donor network must use the ported number service indicator on all calls to ported numbers delivered to the Recipient.
- 5.3.3 A network other than the Donor network, using information regarding ported numbers would use the ported number service indicator on all calls to ported numbers to the Recipient.
- 5.3.4 The handover of calls to ported numbers between an O ASD, PSD, TrSD, CTrSD and a T ASD is to be agreed bilaterally.
- 5.3.5 Notwithstanding sections 5.3.7 and 5.3.8, O ASDs and PSDs must make the necessary interconnection arrangements with Donor network operators if, on an ongoing basis, they wish to request the Donor network operators to act as CTrSDs.

#### Normal Network Conditions

- 5.3.6 A Terminating Access Network receiving a call with a ported number service indicator and the customer is not connected to that network must direct the call to an appropriate Recorded Voice Announcement or tone and should inform the offending network of the error in accordance with agreed service assurance processes.
- 5.3.7 A network should only send calls with the general service termination indicator “3” in the following cases –
  - (a) to the T ASD allocated that number block by the ACA if the number is not ported.
  - (b) to a contracted Transit Service Deliverer
- 5.3.8 Some CTrSDs will only accept a call with the general termination indicator set (3) if the call is to one of its allocated number blocks. Otherwise the call will terminate to RVA or Tone.

#### Adverse Network Conditions

- 5.3.9 Under adverse conditions an O ASD, PSD or CTrSD may be temporarily unable to direct calls to the correct T ASD. In such circumstances, the Donor network may be able to direct calls to ported numbers to the Recipient network of behalf of the other network operator. The O ASD, PSD or CTrSD must negotiate any such backup arrangement with the Donor network operator and advise the Donor at the time that any assistance is required. In the interests of end users and any to any connectivity, the Donor network operator should endeavor to act as the CTrSD for such calls. However, this is subject to the Donor network's network planning rules and its ability to carry additional calls with the dimensioned capacity in its network.
- 5.3.10 Donor network operators should support the porting process as described in section 5.4 below to ensure continuity of calls during the porting process. O ASDs and PSDs should ensure that appropriate arrangements are included in their interconnection agreements with Donor network operators.

#### Introductory Phase

- 5.3.11 During the introductory phase an O ASD/PSD, prior to all of its interconnection arrangements being finalised with Recipient or Donor network operators, might send calls to ported numbers via the Donor network. The O ASD/PSD must negotiate any such arrangement with the Donor network operator. In the interests of end users and any to any connectivity, the Donor network should support the completion of calls

under these circumstances to the best of their ability. However, this is subject to the Donor network's network planning rules and its ability to carry additional calls with the dimensioned capacity in its network. Any Donor network role as interim CTrSD does not relieve the OASD/PSD from its routing responsibilities under the *ACA Telecommunications Numbering Plan 1997* and does not place any long term obligations on the Donor networks other than in their own role as OASD/PSD.

## 5.4 Network Transitions During Porting

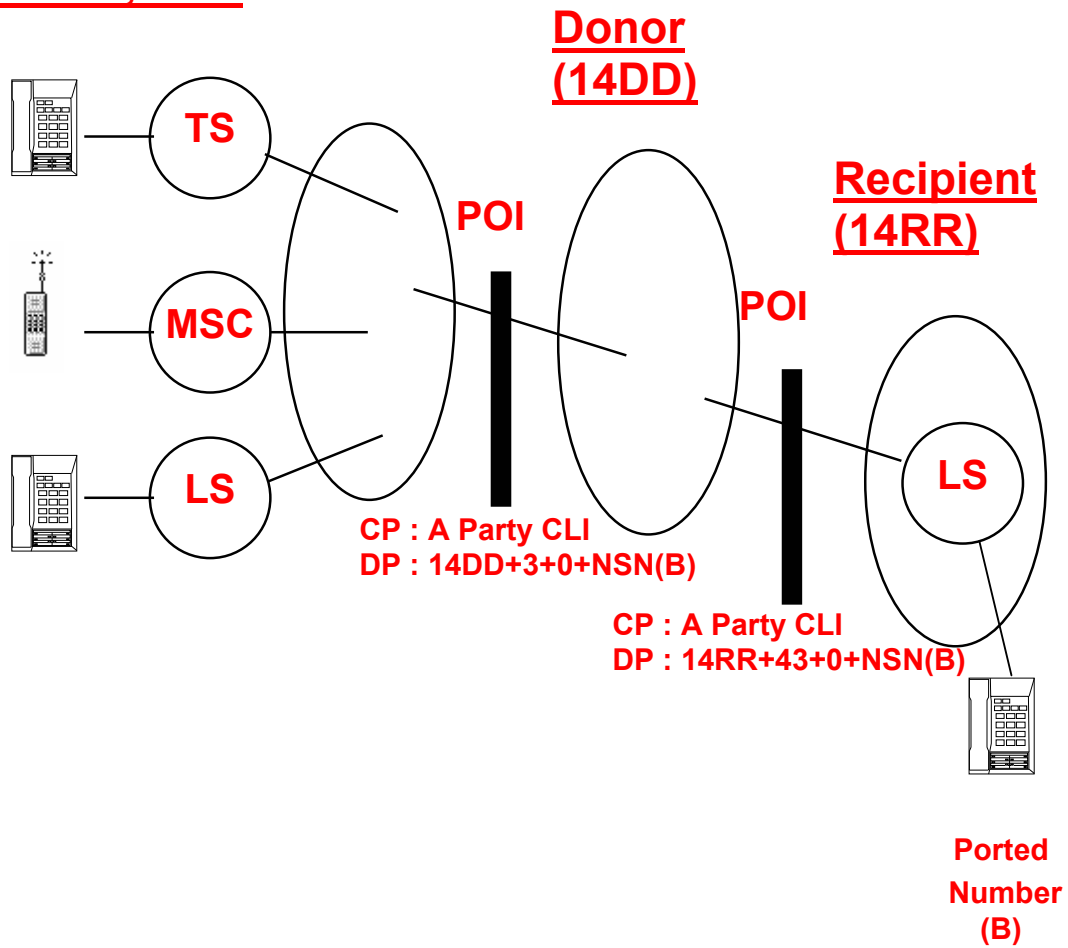
- 5.4.1 If the number is ported from the Donor to a Recipient network, there may be some period before those other networks that wish to send calls directly to the Recipient network can rearrange their networks to do so. Continuity of incoming calls to the customer can be ensured if the Donor network switches such calls to the Recipient network until such time as information on the ported number becomes available and the other networks have time to direct calls directly to the Recipient network.
- 5.4.2 If the number is ported from one Recipient (Losing) network to another Recipient (Gaining) network, calls sent by other networks to the losing network after porting will be lost. The time period for other networks to rearrange routing to the Gaining carrier must be minimised to reduce the occurrence of lost calls.

Note: The *ACA Telecommunications Numbering Plan 1997* specifies that any to any connectivity must be provided on calls to ported numbers.

- 5.4.3 Alternatively, a network operator (OASD/PSD) could adopt the following strategy to minimise lost calls during porting from the Losing network to the Gaining network.
- (a) Establish arrangements with all potential Losing networks to be sent advice of all porting of numbers, consistent with the ACIF LNP Operations Code.
  - (b) When such advice of impending porting of numbers is received, rearrange network routing to send calls to the Donor network. (see Figure 5.7)
  - (c) The Donor network, for a short period of time, would send calls to the Losing network and then the Gaining network after customer connection to the Gaining network is completed. (see Figure 5.8)
  - (d) The other network (OASD/PSD) would then arrange its network to send calls to the Gaining network. (see Figure 5.9)

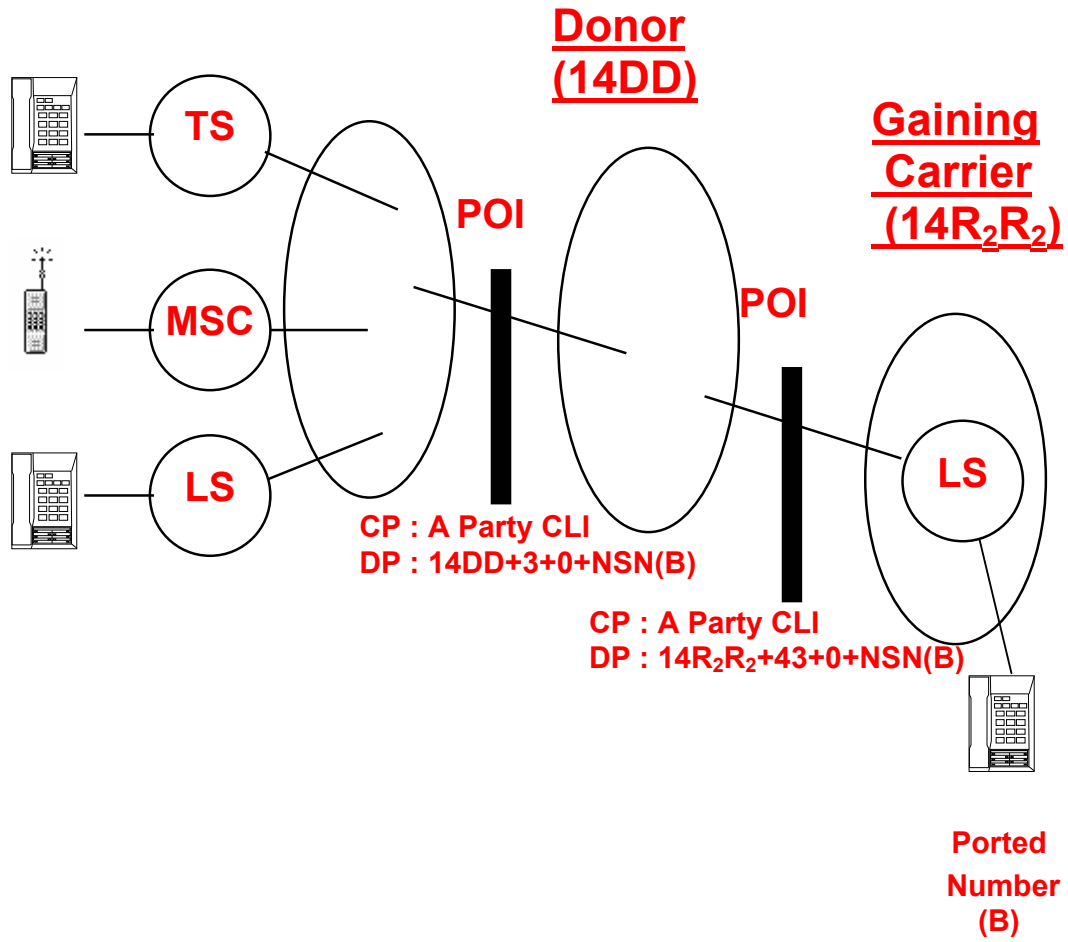
This alternative may require an interconnection agreement between the OASD/PSD and the Donor.

**OASD, PSD**



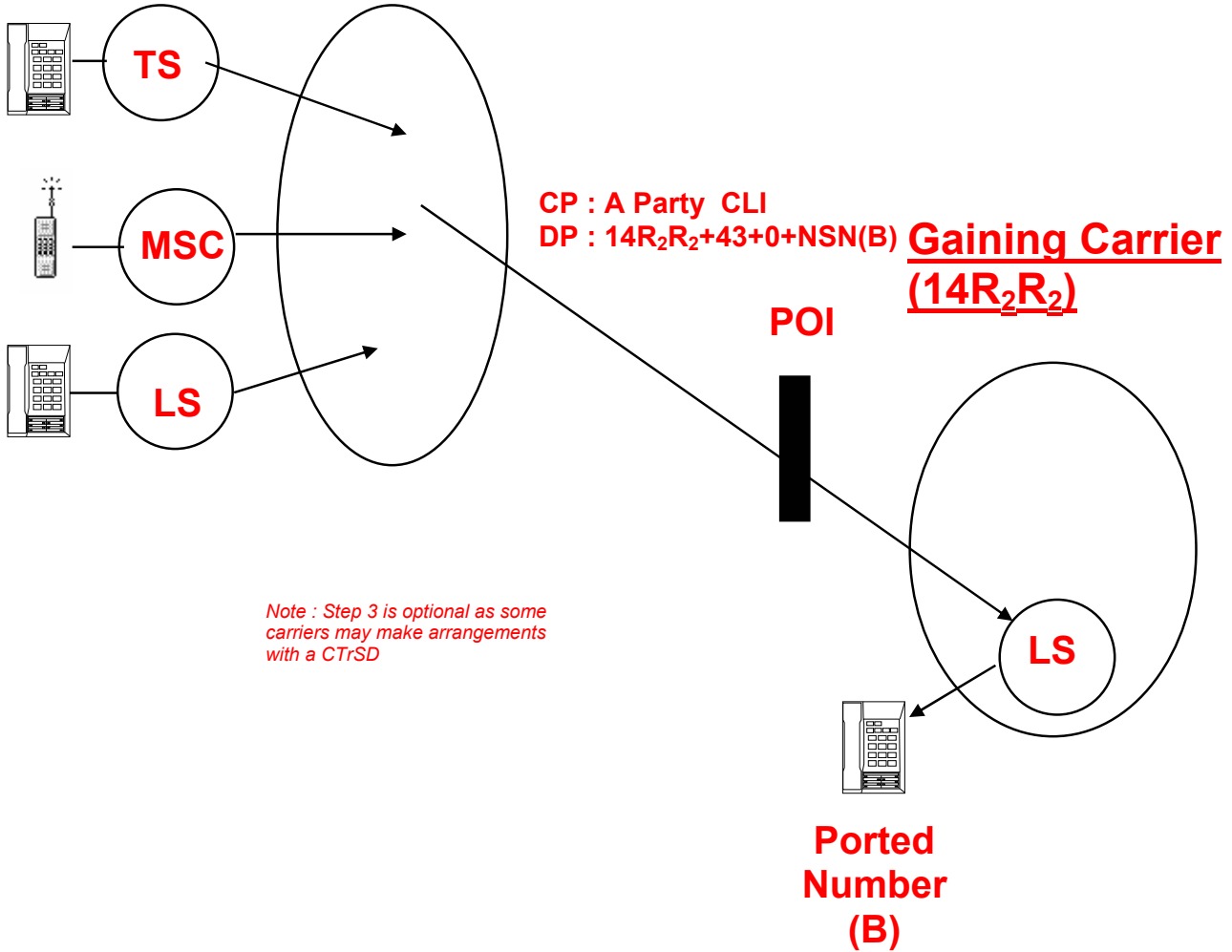
**Figure 5.7**  
Routing via the donor prior to porting

OASD, PSD



**Figure 5.8**  
Donor routes calls to Gaining carrier after porting

OASD, PSD



**Figure 5.9**  
OASD/PSD sends calls direct to Gaining Carrier

**Appendix A- Call Treatment Table for Geographic Numbers (Informative)**

With the introduction of LNP, a carrier may receive calls from other networks with a number of combinations of the carrier identification code and the indication of whether or not the call is to a ported or non-ported number.

Each carrier must set up its network to correctly handle calls destined to its own network and, if in accordance with interconnect agreements, to transit switch calls to other networks. The carrier may also decide to send some types calls to RVA to prevent circular routing of calls.

The Table A-1 below shows how a carrier (Carrier ABC) may arrange treatment of incoming calls to geographic numbers received from another carrier, as a function of:

- (a) The carrier access code and ported number indication that form the interconnection prefix of the incoming call, and
- (b) The Carrier ABC's role for the call.

**Key to the Table:**

The right hand columns of the table show call treatment depending upon whether the customer is connected to Carrier ABC or to another network, and whether or not the number is ported.

The following roles for Carrier ABC are possible -

|       |   |                                      |
|-------|---|--------------------------------------|
| PSD   | = | prime service deliverer              |
| TASD  | = | terminating access service deliverer |
| CTrSD | = | contracted transit service deliverer |
| TrSD  | = | transit service deliverer            |

In each call treatment entry in the table, the following information is given.

Call treatment:

|                   |   |                                  |
|-------------------|---|----------------------------------|
| terminate network | = | call terminates in Carrier "ABC" |
| transit           | = | call sent to another carrier     |
| RVA               | = | call released with announcement  |

Service code for outgoing call. (used in conjunction with the carrier access code)

|     |   |  |
|-----|---|--|
| 3   | = | Far-end handover to donor carrier                          |
| 93  | = | Far-end handover to donor carrier via transit carrier *    |
| 43  | = | Far-end handover to non-donor carrier                      |
| 943 | = | Far-end handover to non-donor carrier via transit carrier* |

\*Not all carriers will use the digit '9' to indicate a transit call.

For each call treatment entry, the type of call termination is given in brackets as

- (a) Normal
- (b) Error or
- (c) Twilight (See Note 3 below).

In Table A-1, the carrier access code for Carrier ABC is “14ab”. Row 1 identifies the number range holder, Row 2 identifies whether or not the number is ported.

In all cases but one, responsibility is predetermined by the incoming interconnection prefix. The one exception is for 14ab3, for which there are two possibilities: T ASD and CTrSD. The treatments for the CTrSD are a superset of the T ASD treatments, but should not be used when the responsibility is only for T ASD. Otherwise the possibility for circular routing exists due to another carrier’s database error. (See Note 7 below.)

Note that the roles of CTrSD and TrSD are only valid if a bilateral agreement exists with either the OASD/PSD. If no such agreement exists then all calls which require this role should be recorded and the offending service providers advised.

**Note 1:** Service code = 3 or 93 is applicable when (1) call transits to carrier with nominal number range allocation or (2) call transits to CTrSD.

**Note 2:** This treatment may be applicable to all calls from a Carrier to numbers within Carrier “ABC’s” allocated number range and which have been ported. Some Carrier’s implementation of local number portability may be unable to perform the routing functions for geographic numbers not in their own allocated number ranges.

**Note 3:** This case should be supported only for an agreed period after porting has occurred. Beyond this period, all such events should be recorded and the originating carrier advised. (See section 5.3)

**Note 4:** Can only arise through an error in the originating carrier’s data base. All such events must be recorded and the originating carrier advised. Note that two treatments are possible. Termination is preferable to an RVA, but not if it introduces any additional complexity or requires extra effort, as these cases are unlikely in practice.

**Note 5:** Can only arise through an error in the originating carrier’s data base. This case must be terminated with an RVA, to avoid the possibility of circular routing (arising from the error in the other carrier’s database). All such events should be recorded and the originating carrier advised.

**Note 6:** This is an error case which may occur during porting, due lack of synchronisation in the update of the data bases of the losing carrier, gaining carrier and donor carrier. Except where this reason applies, all such events should be recorded and the other carrier advised.

**Note 7:** These cases are invalid and can only arise through errors in the originating carrier’s data base. It is assumed here that the TrSD function only requires call delivery to the specified carrier. It is also assumed that full number analysis is not required. It is the responsibility of the destination carrier to handle these cases and notify the originating carrier.

**Note 8:** Some carriers may need to terminate such calls through a CTrSD, for example, the Donor network.

**Note 9:** Some carriers cannot perform the CTrSD role outside of their own allocated number ranges and may need to block calls received with numbers that are not within their own number range.



**Note 10:** The use of subsequent transit networks, following transit through one carrier, is not recommended. (See note 1 to Figure 5.6).

**SPECIFICATION**

| Plan Reference            | Received Interconnect Prefix | Carrier "ABC" role | Carrier "ABC" is the Number Range Holder             |  | Another Carrier is the Number Range Holder                |   |
|---------------------------|------------------------------|--------------------|--|--|---|---|
|                           |                              |                    | Number connected to Carrier "ABC" (Not Ported)       | Number connected to Carrier "Recipient" (Ported)               | Number is Ported to Carrier "ABC"                         | Number is not connected to Carrier "ABC"                        |
|                           | 14ab(0)                      | PSD                | Terminate (normal type)                              | Transit.<br>Outgoing SC =43 or 943 (normal type)               | Terminate (normal type)<br>Note 8                         | Transit.<br>Outgoing SC = 3, 43, 93 or 943 (normal type) Note 1 |
|                           | 14ab5                        | PSD                | Terminate (normal type)                              | Transit.<br>Outgoing SC = 43 or 943 (normal type)              | Terminate (normal type)<br>Note 8                         | Transit.<br>Outgoing SC = 3, 43, 93 or 943 (normal type) Note 1 |
| Fig 5.5 and 5.6           | 14ab3                        | CTrSD              | Terminate (normal type)                              | Transit.<br>Outgoing SC = 43 or 943 (normal type) Note 2       | Terminate (normal type)<br>Note 9                         | Transit.<br>Outgoing SC = 43 or 943 (normal type) Note 9        |
| Fig 5.6                   | 14xy3                        | TrSD               | Error condition<br>Call incorrectly prefixed. Note 7 | Transit.<br>Outgoing SC = 3 (normal type) Note 2               | Transit<br>Outgoing SC = 3 (normal type)                  | Transit.<br>Outgoing SC = 3 or 43 (normal type)                 |
| Fig 5.6                   | 14xy43                       | TrSD               | Error condition<br>Call incorrectly prefixed. Note 7 | Transit.<br>Outgoing SC = 43 (normal type) Note 2              | Error condition<br>Call incorrectly prefixed.<br>Note 7   | Transit.<br>Outgoing SC = 3 or 43 (normal type)                 |
| Fig 5.2 and 5.3           | 14ab3                        | TASD               | Terminate (normal type)<br>(Fig 5.2)                 | Transit.<br>SC = 43 or 943 (twilight type) Note 3<br>(Fig 5.3) | Terminate or RVA (error type)<br>Note 4                   | RVA (error type)<br>Note 5                                      |
| Fig 5.1, 5.3, 5.5 and 5.6 | 14ab43                       | TASD               | Terminate or RVA (error type) Note 4                 | RVA (error type) Note 6  | Terminate (normal type)                                   | RVA (error type) Note 6   |
| Fig 5.6                   | 14xy93                       | TrSD               | Error condition<br>Call incorrectly prefixed         | Transit.<br>Outgoing SC = 3 or 93 (normal type) (Note 10)      | Transit.<br>Outgoing SC = 3 or 93 (normal type) (Note 10) | Transit.<br>Outgoing SC = 3 or 93 (normal type) (Note 10)       |
| Fig 5.6                   | 14xy943                      | TrSD               | Error condition<br>Call incorrectly prefixed. Note 7 | Transit.<br>Outgoing SC = 43 or 943 (normal type)              | Error condition<br>Call incorrectly prefixed.<br>Note 7   | Transit.<br>Outgoing SC = 43 or 943 (normal type)               |

**Table A-1**  
**Incoming Calls to Geographic Number**

ACIF is an industry owned, resourced and operated company established to implement and manage communications self-regulation within Australia. ACIF's role is to develop and administer technical and operating arrangements to foster a thriving, effective communications industry serving the Australian community through

- the timely delivery of Standards, Codes and other documents to support competition and protect consumers;
- widespread compliance; and
- the provision of facilitation, coordination and implementation services to enable the cooperative resolution of strategic and operational industry issues.

ACIF comprises a Board, an Advisory Assembly, standing Reference Panels, task specific Working Committees, Industry Facilitation/Coordination Groups, Consumer Advisory Bodies and a small Executive. Its members include carriers, carriage/content service providers, business and residential consumer groups, industry associations and individual companies.

The ACIF Standards and Codes development process involves the ACIF Board, Reference Panels, Working Committees and the ACIF Executive. The roles and responsibilities of all these parties and the applicable operating procedures are specified in the ACIF Operating Manual.

These procedures are based upon ACIF's openness, consensus, representation and consultation imperatives and have been designed to ensure that all sectors of Australian society are reasonably able to influence the development of Standards and Codes. Reference Panels and Working Committees must be representative of parties interested in the subject matter of the body of work being undertaken. All draft Codes/Standards are also released for public comment prior to publication to ensure outputs reflect the needs and concerns of all stakeholders.

**Care should be taken to ensure that material used is from the current version of the Standard or Industry Code and that it is updated whenever the Standard or Code is amended or revised. The number and date of the Standard or Code should therefore be clearly identified. If in doubt please contact ACIF.**



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