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# High-Speed Data Enhancements for cdma2000 1x – Data Only

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## 1   **1   PURPOSE**

2   This document outlines the key operator requirements for the evolution of the  
3   cdma2000 1x (current versions of C.S0001 through C.S0005) standard. This  
4   document will refer to this evolution as 1x evolved high-speed data only (1xEV-  
5   DO). These requirements are defined to drive improvements to the  
6   fundamental packet data capabilities and efficiencies of cdma2000 1x systems  
7   to better meet the rapidly evolving needs of subscribers. This document is  
8   intended as a guide for wireless operators in the implementation of high-speed  
9   data-only systems beyond cdma2000 1x, to provide increased spectral  
10   efficiency and the capability to satisfy customer demand for wireless packet  
11   data applications.

## 12   **2   DOCUMENT SCOPE**

13   The scope of this document is to define requirements for all aspects of 1xEV-  
14   DO systems.

## 15   **3   REFERENCES**

- 16   •    **TIA/EIA/IS-95**            Mobile Station-Base Station Compatibility  
17                                    Standard for Dual-Mode Wideband Spread  
18                                    Spectrum Cellular System
- 19   •    **TIA/EIA/IS-95-A**        Mobile Station-Base Station Compatibility  
20                                    Standard for Dual-Mode Wideband Spread  
21                                    Spectrum Cellular System
- 22   •    **TIA/EIA-95-B**            Mobile Station-Base Station Compatibility  
23                                    Standard for Dual-Mode Wideband Spread  
24                                    Spectrum Cellular System
- 25   •    **C.S0001**                Introduction to cdma2000 Standards for Spread  
26                                    Spectrum Systems
- 27   •    **C.S0002**                Physical Layer Standard for cdma2000 Spread  
28                                    Spectrum Systems
- 29   •    **C.S0003**                Medium Access Control (MAC) Standard for  
30                                    cdma2000 Spread Spectrum Systems
- 31   •    **C.S0004**                Signaling Link Access Control (LAC) Standard  
32                                    for cdma2000 Spread Spectrum Systems
- 33   •    **C.S0005**                Upper Layer (Layer 3) Signaling Standard for  
34                                    cdma2000 Spread Spectrum Systems
- 35   •    **A.S0001**                Access Network Interfaces Technical  
36                                    Specification

1 **4 SYSTEM DESCRIPTION**

2 The system described by this document is optimized for non-real time, high-  
3 speed packet data services and in which the high-speed packet data service  
4 operates on a separate, data-only channel (1xEV-DO). If the subscriber  
5 invokes voice or another real-time service, the system should use a cdma2000  
6 1x voice/data channel, as is currently defined by the reference specifications.  
7 This operation should be transparent to the user.

8 It is desirable to have a graceful evolution from TIA/EIA/IS-95-A, TIA/EIA-95-  
9 B, and cdma2000 that minimizes impact to terminals and to infrastructure so  
10 as to achieve the most economical evolution

11 **5 REQUIREMENTS**

12 **5.1 Core Network**

13 It shall be possible to perform handoffs between the 1xEV-DO systems and  
14 systems that are based on the 3GPP2 network specifications. It should be  
15 possible to perform handoffs between the 1xEV-DO systems and systems that  
16 are based on the GSM-MAP network specifications.

17

## 1 5.2 Information Data Rates

2 The 1xEV-DO specification shall enable a range of information data rates  
3 suitable for high-speed packet data applications as specified in the following  
4 table.

5 **Table 1 – Information Data Rate Requirements**

6

	1xEV-DO	
	Forward Link	Reverse Link
Vehicular Peak Data Rate <sup>1</sup>	1.25 Mbps	144 kbps
Vehicular Average Data Rate <sup>2</sup>	600 kbps	144 kbps
Fixed/Pedestrian Data Rate <sup>3</sup>	2 Mbps	144 kbps

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1. "Vehicular Peak Data Rate" is defined as the maximum instantaneous information data rate available to any given user in a high-speed handoff mobile application.
  2. "Vehicular Average Data Rate" is defined as the system-wide average information data rate available per sector in a fully-loaded system with all users moving at vehicular speed.
  3. "Fixed/Pedestrian Data Rate" is defined as the information data rate available to any given user either fixed or moving at pedestrian speed.

13  
14 The objective of the 1xEV-DO specification is to provide the largest practical  
15 number of users to run high-speed packet data applications. It is desirable  
16 that the specification be scalable to wider bandwidth channels in the future  
17 (e.g. 3x 1.25MHz channel).

## 18 5.3 General Requirements

19 The 1xEV-DO specification shall enable:

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- High-speed, non-real-time, packet data capability;
  - Interoperability (including handoff) with cdma2000 1x channels for packet services;
  - Deployment in all frequency bands where cellular and PCS systems are deployed;
  - Asymmetric data rates;
  - Always-on Capability(e.g., no need to go through dial-in, and no user action required, for PDSN log-on process);

- 1 • Use of existing TIA/EIA/IS-95-A, TIA/EIA-95-B, and cdma2000  
2 antennas, active, smart, and directional antennas for specific  
3 applications; and
- 4 • Use of traffic balancing mechanisms for all 1xEV-DO frequency channels.

#### 5 **5.4 Radio Environment**

6 The coverage for 1xEV-DO shall align closely with IS-95 and cdma2000 1x.  
7 The objective of the coverage requirements is to ensure that operators can use  
8 existing cell/sector configurations without cell splitting. The purpose is to  
9 deploy 1xEV-DO on existing BTS equipment, which can operate a number of  
10 RF channel, including a mix of IS-95, cdma2000 1x, and 1xEV-DO. Out-of-  
11 band-emissions for 1xEV-DO shall comply with equivalent requirements for  
12 cdma2000 1x systems.

13 1xEV-DO shall support both mobile and fixed users.

#### 14 **5.5 Interoperability Specification Support**

15 1xEV-DO shall be compatible with the current version of the Interoperability  
16 Specification [A.S0001].