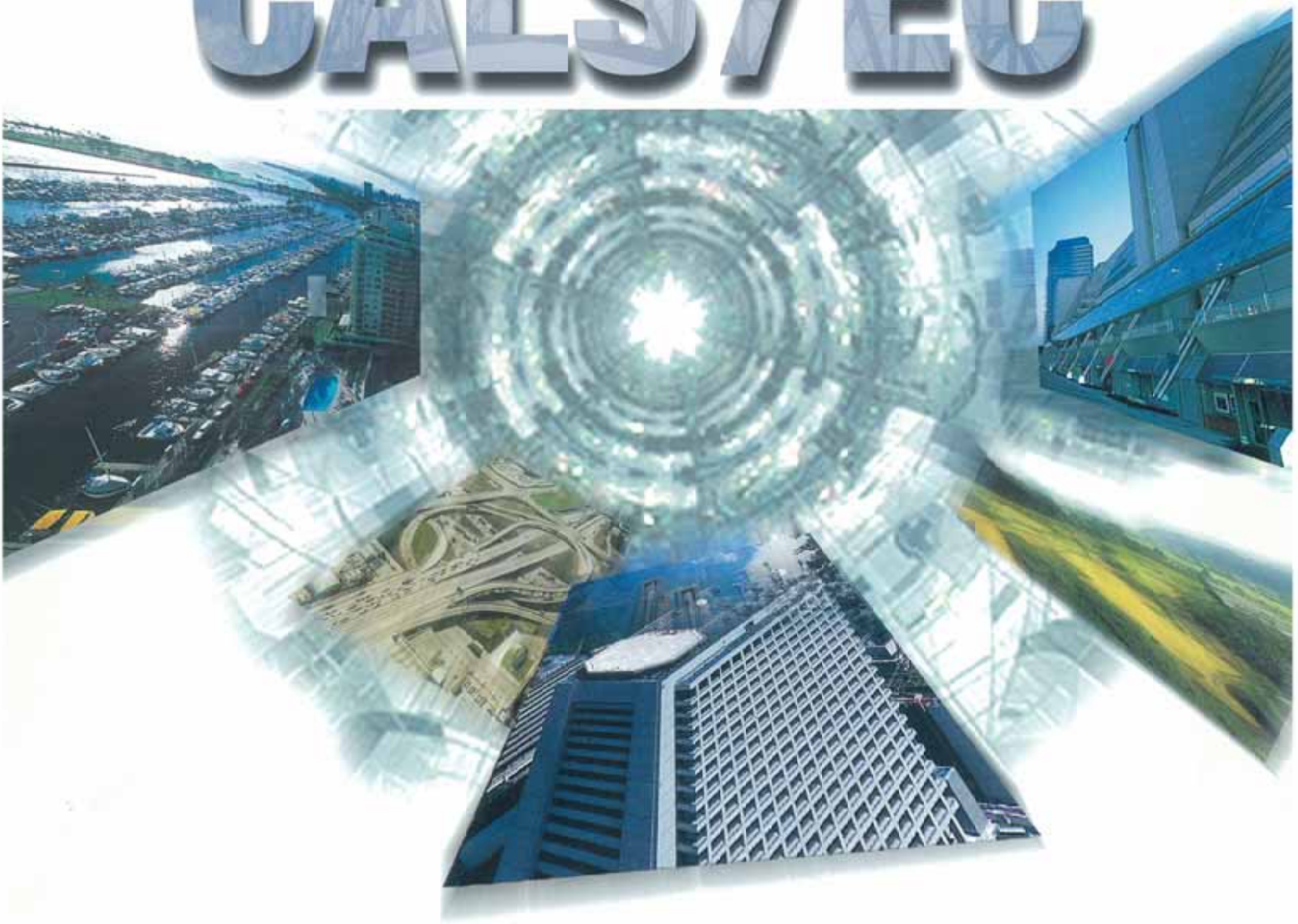
Reform of Public Works by IT

CALS/EC



Ministry of Land, Infrastructure and Transport

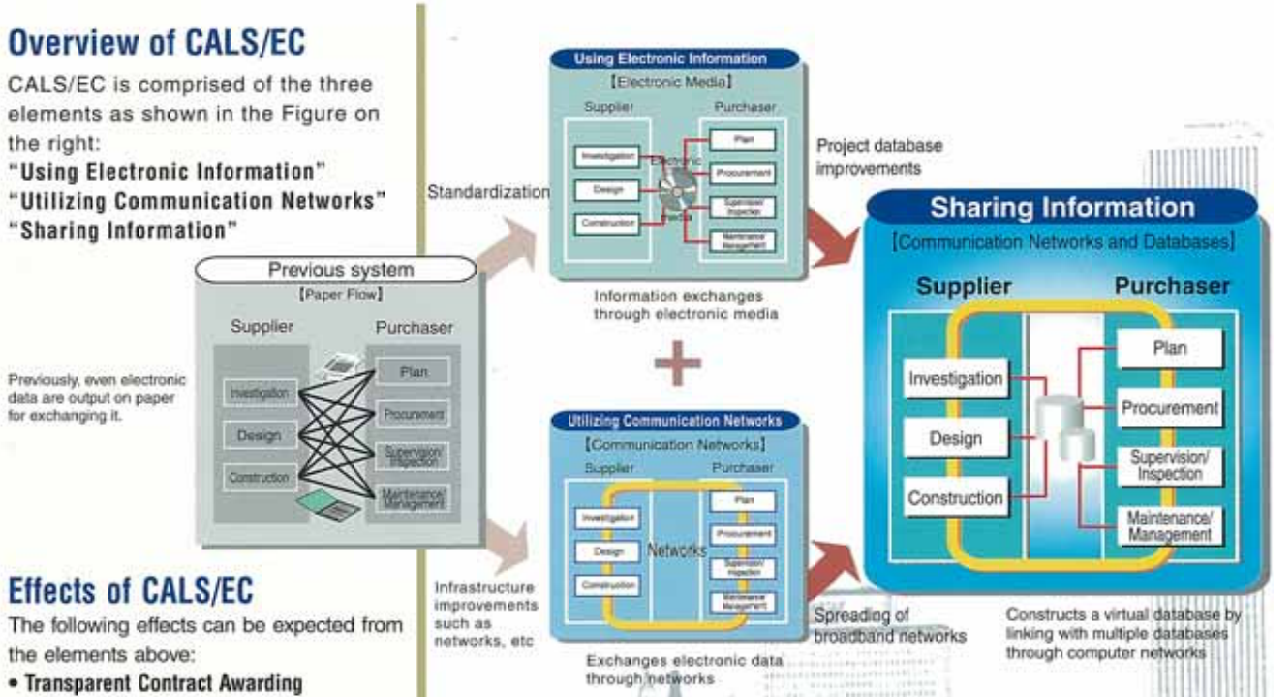
CALS/EC by Ministry of Land, Infrastructure and Transport

The Ministry of Land, Infrastructure and Transport's CALS*1/EC*2 started up fully with the launch of Electronic Bidding and Electronic Delivery in 2001. CALS/EC stands for "Public Works Support Integrated Information System." This is a mechanism using electronic information and computerization, instead of paper-based information exchange. It also uses the Internet to create an environment allowing linkage of many public works databases.

Overview of CALS/EC

CALS/EC is comprised of the three elements as shown in the Figure on the right:

"Using Electronic Information"
"Utilizing Communication Networks"
"Sharing Information"



Effects of CALS/EC

The following effects can be expected from the elements above:

- **Transparent Contract Awarding Procedures for Public Works**
- **Higher Efficiency**
- **More Interaction Between Citizens and Administration**
- **Improvement of Work Process at Construction Site**

Information Standardization

Standardizing information is indispensable for creating and exchanging electronic information. If the computerization of information proceeds without standardization, huge amounts of data that cannot be read with each other will be created, thus it leads to more confusion in work. In addition, it will require the installation of various terminals that have no interoperability, which results in rising costs. Standardization cannot be avoided to promote CALS/EC.

1. Transparent Contract Awarding Procedures for Public Works

Bidding procedures for public works have been criticized as not very clear. By changing the procedures to those that use the Internet, the procedures will become more transparent to people.

2. Higher Efficiency

Changing result printed on paper to electronic data enables data work to be more efficient by preventing duplicate input of the data, etc.

3. More Interaction Between Citizens and Administration

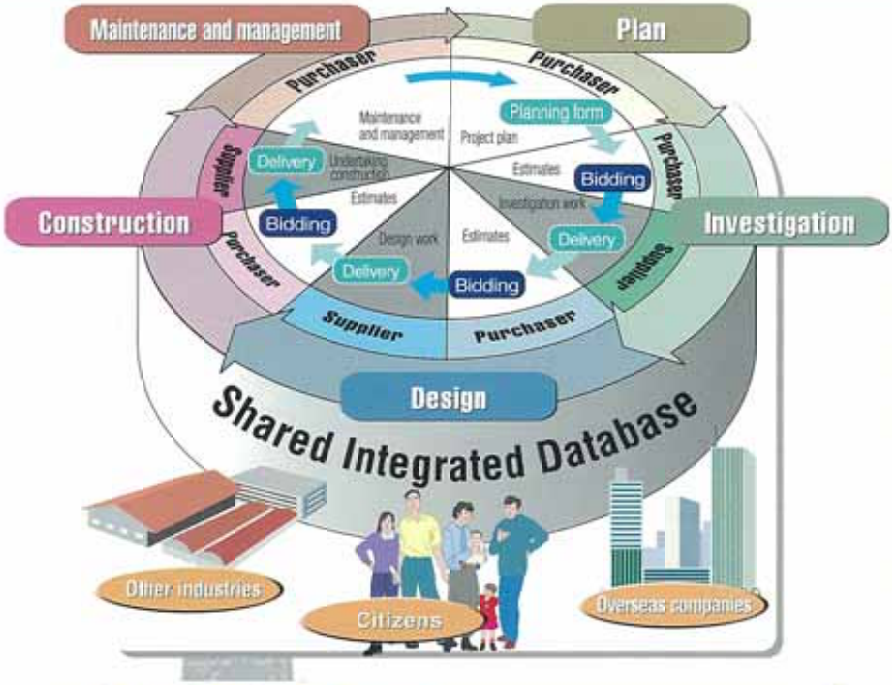
A system will be built whereby each citizen and executers of public works can directly engage in conversation by combining Internet home pages and electronic mail.

4. Improvement of Work Process at Construction Site

Public works construction sites have been looked upon as places where hard work is performed and that are dirty and dangerous. Work sites will greatly improved by IT.

*1 CALS (Continuous Acquisition and Life-cycle Support): A concept or an activity to reduce product development time, costs, and to improve productivity by transferring product or entire life-cycle information from design to manufacturing, distribution and maintenance between departments, corporations electronically and to enable data exchanges and data sharing, etc. for technology and transaction information through computer networks.

*2 EC (Electronic Commerce): Electronic commercial transactions performed on the networks. In the construction field, the use of EC technology for procurement of public works (bidding and contracts) and online trades between companies are attracting attention.



Life-cycle Support

As already described, CALS/EC is an effort to fully rationalize services throughout the life-cycle of public works. Processes in public works will undergo from plan, investigation, design, construction, maintenance and management, as well as renewal. In each process, various information is exchanged between the related parties.

The following are efforts on CALS/EC for each corresponding service:

- **Electronic bidding**
- **Information sharing between purchaser and supplier while implementing work**
- **Electronic delivery**

These are expected to be integrated in the future, into:

- **Shared integrated database**

Shared Integrated Database

"Shared Integrated Database" integrates all information from the planning stage to maintenance and management in one (virtual) database for sharing information with citizens as well as between related parties. Through this database, existing information is mutually linked and used effectively through the entire project life-cycle.

CALS/EC Action Program

Since 1995, Construction CALS/EC (Ministry of Construction), Port CALS and Airport Facilities CALS (Ministry of Transport) have been promoted as activities to realize efficient execution of public works as well as to decrease construction costs and ensure and improve the quality of public facilities.

The Ministry of Land, Infrastructure and Transport (hereinafter, referred to as MLIT), established in January 2001, decided to integrate these three schemes and position them as CALS/EC, then, it decided to introduce CALS/EC into every process of public works administrated by MLIT by fiscal year 2004. Furthermore, the "Local Promotion Action Program" was declared in June 2001, targeting the complete realization of CALS/EC for all public purchasers, including local government agencies by fiscal year 2010.

Schedule Outline	Phase 1	Phase 2	Phase 3	
	FY 1996 to 1998 (FY 1996 to 1999)	FY 1999 to 2001 (FY 2000 to 2002)	FY 2002 to 2004 (FY 2003 to 2004)	By FY 2010
Construction CALS/EC	• Preparing a PC environment for all staff to make use of the Internet • Start of verification test	• Implementation of Electronic Procurement System in small number of construction works projects • Start of Electronic Delivery of results	• Implementation of CALS/EC for all public works projects administrated by MLIT	Implementation of CALS/EC in all public purchasers including local government agencies
Port CALS	• Preparing a Port CALS environment • Start of model project	• Construction of Integrated Database System • Establishment of framework for installing the Electronic Procurement System		
Airport Facilities CALS	• Settling Airport Facilities CALS Grand Design • Start of model project	• Construction of Integrated Database System	• Application of Airport Facilities CALS in public works projects administrated by MLIT	

Fiscal years for Airport Facilities CALS are shown in ( )

Delivery Stage

Electronic Delivery

Operate Information in an Optimum Format

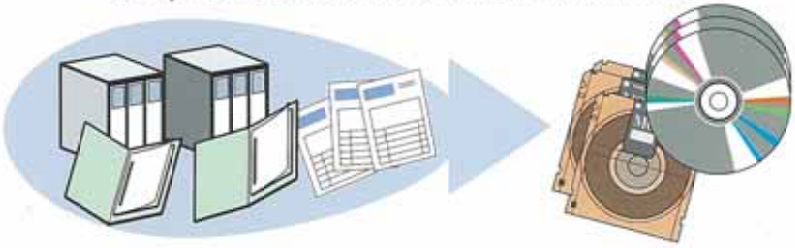
From fiscal year 2001, the "Electronic Delivery" service for the delivery of electronic files containing final results of each work process such as investigation, design and construction started for public works projects administrated by the MLIT.

Procedures and Standards

To appropriately manage the products, standardization of format is required. Standardization allows multiple information to be handled together and the contents to be easily understood, even if it is new information.
In addition, electronically-delivered data can be managed centrally by utilizing an information sharing server, etc., thus both purchaser and supplier can pick out required information whenever needed.
As rules for standardization, procedures and standards shown in the table are settled to enable electronic delivery for public works projects administrated by the MLIT from fiscal year 2001.
These documents can be obtained from the following home page of the National Institute for Land and Infrastructure Management.
http://www.nilim.go.jp/japanese/denshi/calsec.htm
<Japanese only>

As a current measure for staff in the MLIT to support electronic delivery, the "Guideline for Electronic Delivery Operations (draft)" has been settled. In addition, to show the items and policies to be discussed at the start of construction for smooth implementation of the electronic delivery, the "Guideline for Prior Consultations on Electronic Delivery at Work Sites (draft)" has been settled.

Computerization of Work Result Information

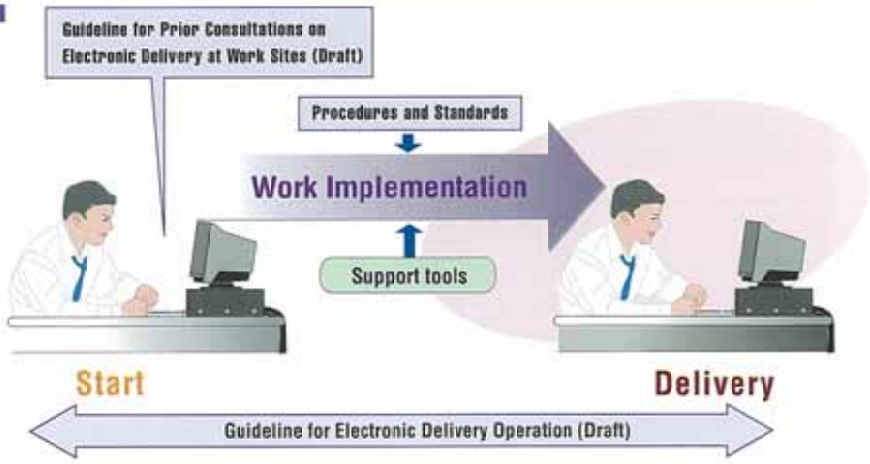


Procedures and Standards	Adopted/Revised
Standard for Digital Photo Control Information (Draft)	Adopted in Mar. 1999
Procedures for Electronic Delivery of Civil Engineering Design Work (Draft)	Revised in Aug. 2001
Procedures for Electronic Delivery of Documents Upon Completion of Works (Draft)	Revised in Aug. 2001
CAD*7 Drafting Standard (Draft)	Revised in Aug. 2001
Procedures for Geological Survey Data Sorting (Draft)	Revised in Aug. 2001
Guidelines	**Adopted**
Guideline for Electronic Delivery Operation (Draft)	Adopted in Mar. 2001
Guideline for Prior Consultations on Electronic Delivery at Work Sites (Draft)	Adopted in Mar. 2001

(as of January 2002)

Procedures for Electronic Delivery

When implementing a work, a full understanding of procedures and standards as well as discussions between supplier and purchaser enables smooth electronic delivery after implementing the work. Labor savings are also realized through effort to computerization of documents during the construction. Various tools for supporting the electronic delivery are also available.



*7 CAD (Computer-Aided Design, and indicates computerized design-support systems): A large variety of software is used in Japan, but data standards vary. The CAD Data Exchange Standards Development Consortium (SCADEC) which was set up between March 1999 and August 2000 developed SXF exchange standard based on ISO standard STEP/AP202, enabling data exchanges between different CAD software. SXF is going to be used in electronic delivery.
http://www.cad.jacic.or.jp/en/scadec_e.htm