



WF21183

## **AutoCAD Civil 3D Integration Requirements: BIM Process Optimization for Infrastructure**

Nicolas RAGEUL  
EGIS

Lionel FABRE  
Bruno LAUMONDAIS  
AUTODESK

At the end of this class, you will be able to:

1. Define & manage AutoCAD Civil3D standardization in a BIM process for infrastructure design
2. Define, deploy and maintain a flexible company standardization that
  - a. is adaptable to different projects requirements
  - b. can easily evolve to meet new requirements
3. Understand the advantages of an early use of The Sub-Assembly Composer, as well its limitations on projects

### **Description**

During this class the participants will learn about the BIM processes designed and implemented by EGIS for highway & road design. The class will focus on the standardization of design and collaboration for infrastructure projects using AutoCAD Civil3D.

The participants will discover how to deploy a collaborative standardization of the AutoCAD Civil3D platform. The participants will also learn how to manage standardization for multidisciplinary applications such as roads, bridges, airports, etc. In addition, they will learn how to manage AutoCAD Civil3D to integrate different requirements such as their company's own production rules, local or international design standards and client requirements such as customized outputs.

### **Your AU Expert(s)**

Nicolas RAGEUL is a Land Survey Engineer and a Master of Geomatic Science with 10 years of professional experience. His expertise includes GIS, 3D CAD and BIM project assistance, audit and diagnostics, as well as geospatial data processing with ETL tools, GIS-CAD-EDMS and 3D modeling. After several years as a surveyor, he worked for 3 years as an Autodesk Reseller, responsible for civil engineering design software deployment.

At Egis, he has been working in the "Technical and Innovation" Department since 2011. He has been responsible for software benchmarking as well as deployment and production methodology development for road infrastructure applications for last two years. More specifically, he develops BIM processes and specifications for the implementation of AutoCAD Civil 3D and other tools for Egis projects.

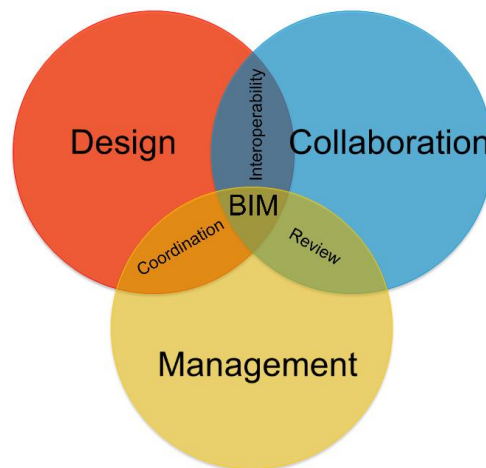


## Define & manage AutoCAD Civil3D standardizations in a BIM process for infrastructure design

### EGIS BIM Concept

At Egis, the essence of BIM is defined by CE Tolmer, PhD., as « Improving the processes by a concurrent engineering approach and a model centred vision ».

Egis focuses on three areas: Design, Collaboration and Management



A project is continuously facing constraints and must respect the requirements of others, those of the client or the sponsor, other constraints relate to the discipline (road, rail, structures), or to the design standard in use in the country (DMRB, ASHTOO, ICTAAL....). Additionally, the designer may also have internal constraints (CAD Manual...).

“A concurrent engineering approach and a centered vision” also means asking the right questions on technology, processes and workflows.

Civil 3D with its multi-disciplinary management capacity is no exception to the above,

### **Solutions by EGIS to manage collaborative standardization using the AutoCAD Civil3D Platform**

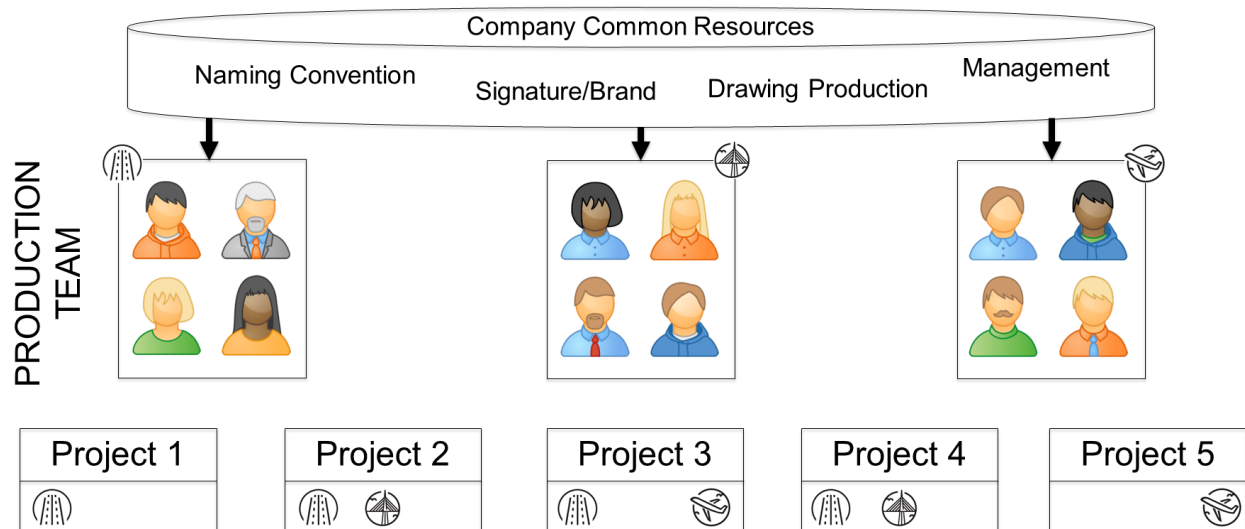
New projects, new requirements			All projects, same requirements		
CLIENT	OWNER	SPECIFIC	DISCIPLINE	COUNTRY	COMPANY
TECHNOLOGICAL REQUIREMENTS					

AutoCAD Civil 3D 2016



## AutoCAD Civil 3D Integration Requirements

The best respond to project needs, production teams are defined by technical categories (road engineering, airport engineering, etc). The challenge is therefore to maximize a common engineering approach across multi-disciplinary projects.



### *PRODUCTION MANAGEMENT*

In this environment, there are several constraints in the integration of AutoCAD Civil 3D:

- The ability to manage the required human resources as a function of the need (expertise, absences, etc.)
- The capacity to make the Company Common Resources available “anywhere, anytime”
- The ability to adapt Company Common Ressources as projects evolve
- The facility to progress project specific needs independently of other projects



# Define, deploy and maintain a flexible company standardization

## First Standardization

Like the Autodesk Country Kit, Egis created the “Company Kit”, which includes:

- Styles
- Labels
- Sub-Assemblies
- Company Reports
- Specific Developments
- Layer Naming Convention

Although Installation, deployment and update are flawless, we are confronted by 3 challenges:

- Have you ever tried to properly desinstall a country kit with Civil 3D 2013?
- Have you ever tried to adapt a country kit in more than one way?
- How do you know which version is on a computer? in a single user session ?

## On the road to a new solution

A single “Company Kit” is therefore not enough if :

- There is more than 1 discipline
- There is more than 1 project

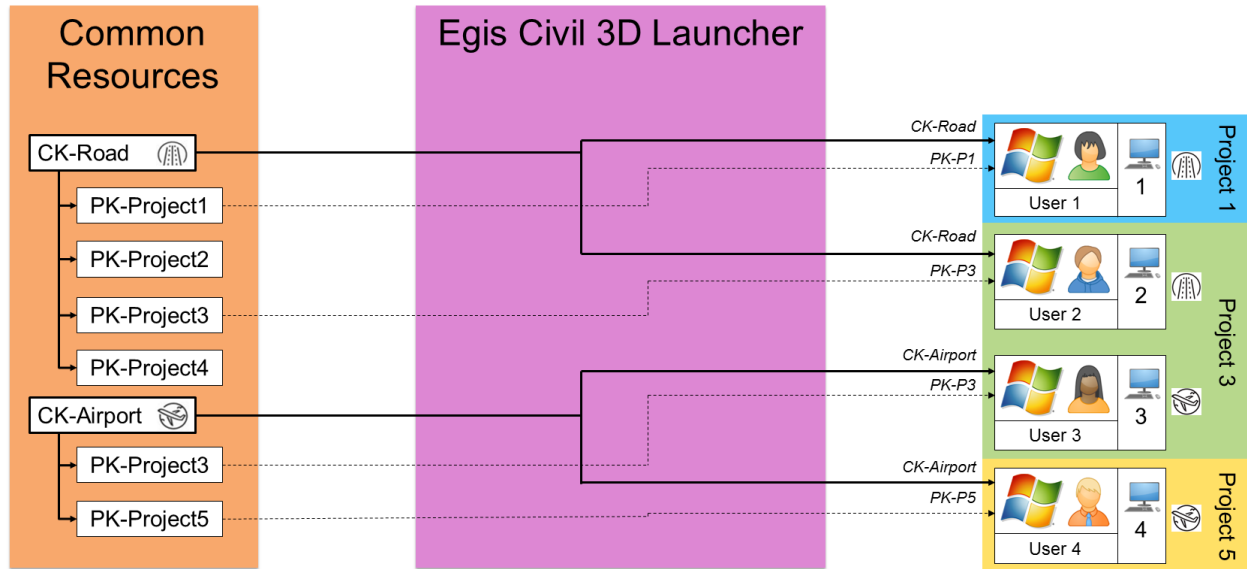
Egis being a multi-section/multi-discipline organization, we have kept the “Company Kit” (CK) name, in the “Discipline” sense. This Company Kit 2.0 allows us to respond to requirements independently of the projects. We have created a second Civil 3D concept : the “Project Kit” (PK), which is directly related to a project.

We have developed ten constraints/rules to improve our performance. Notably, they include :

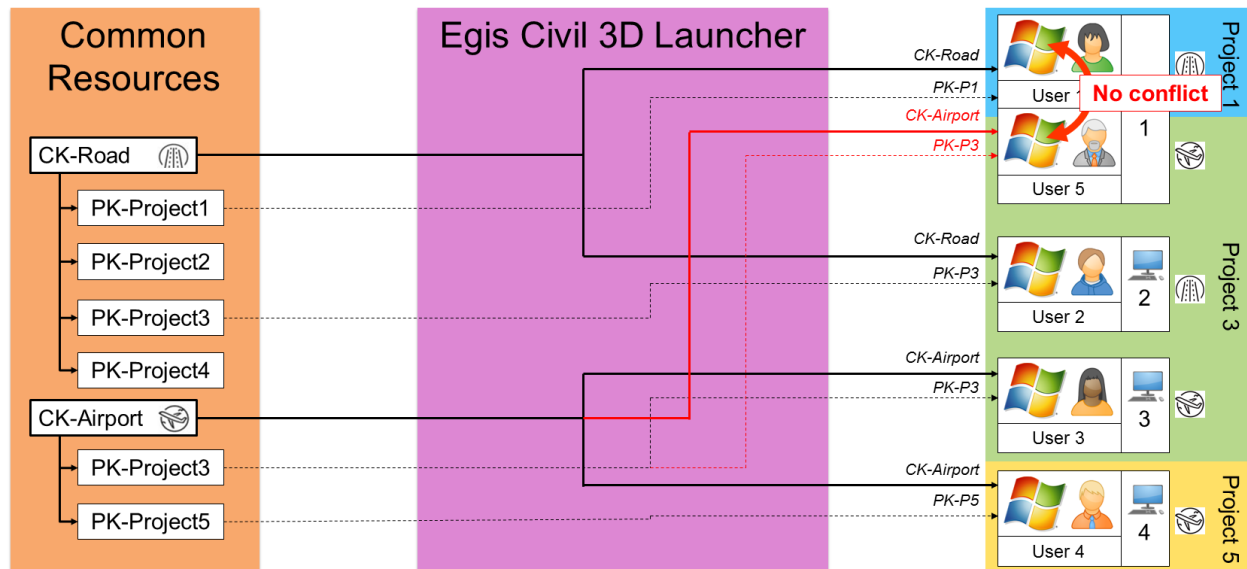
- Installation of multiple CK and PK
- Versioning of CK and PK
- Installer kit dependency (Project Kit depends on a CK)
- Handling of user conflicts
- Proper desinstallation
- Different responsibilities between CK and PK managers.



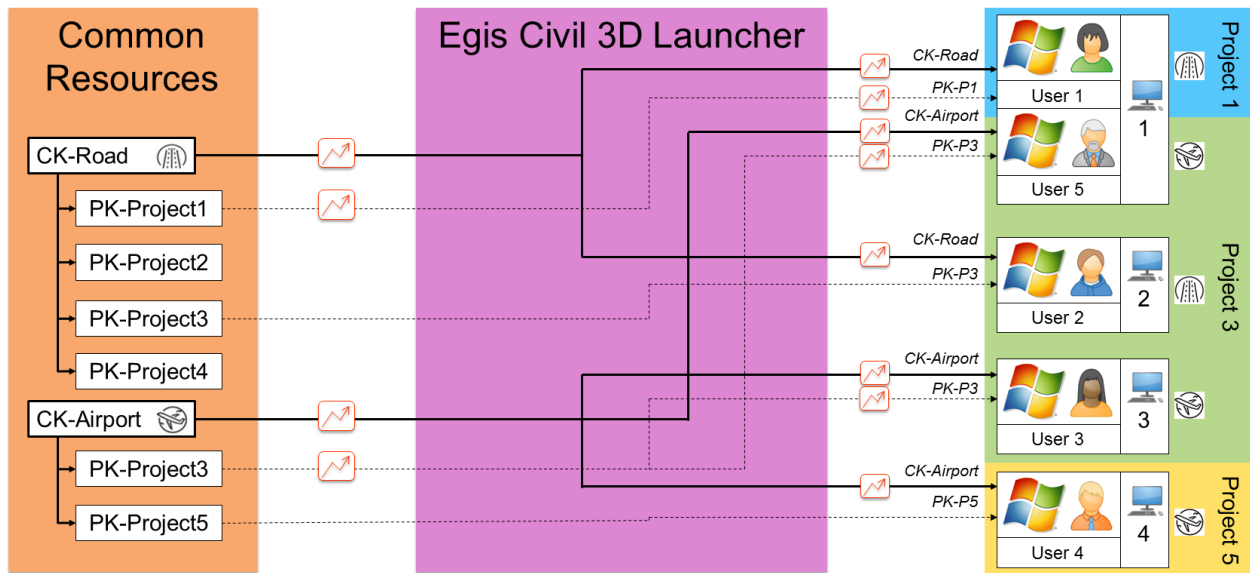
## On the road to a new solution



*EGIS CIVIL 3D LAUNCHER : INTERFACE BETWEEN THE COMMON RESOURCES AND THE USERS*



*EGIS CIVIL 3D LAUNCHER : NO CONFLICT BETWEEN THE USERS WINDOWS SESSIONS, THE CK AND THE PK*



*EGIS CIVIL 3D LAUNCHER : AUTOMATIC MANAGEMENT OF UPDATES*

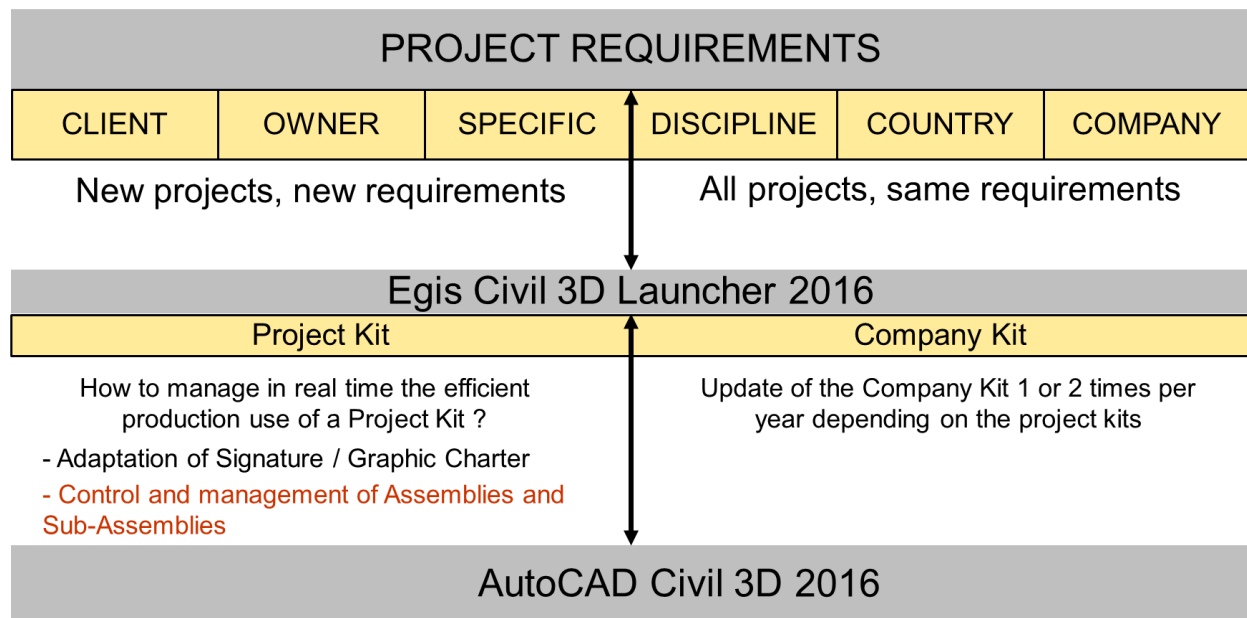


## Highlight the advantages of an early use of Sub-Assembly Composer and its limitations on projects

### How to optimize C3D projects ? By Sub-Assembly management...

On a Civil 3D project, there are 2 main topics:

- Adaptation of Signature / Graphic Charter
- Control and Management of Assemblies and Sub-Assemblies, being the most complex

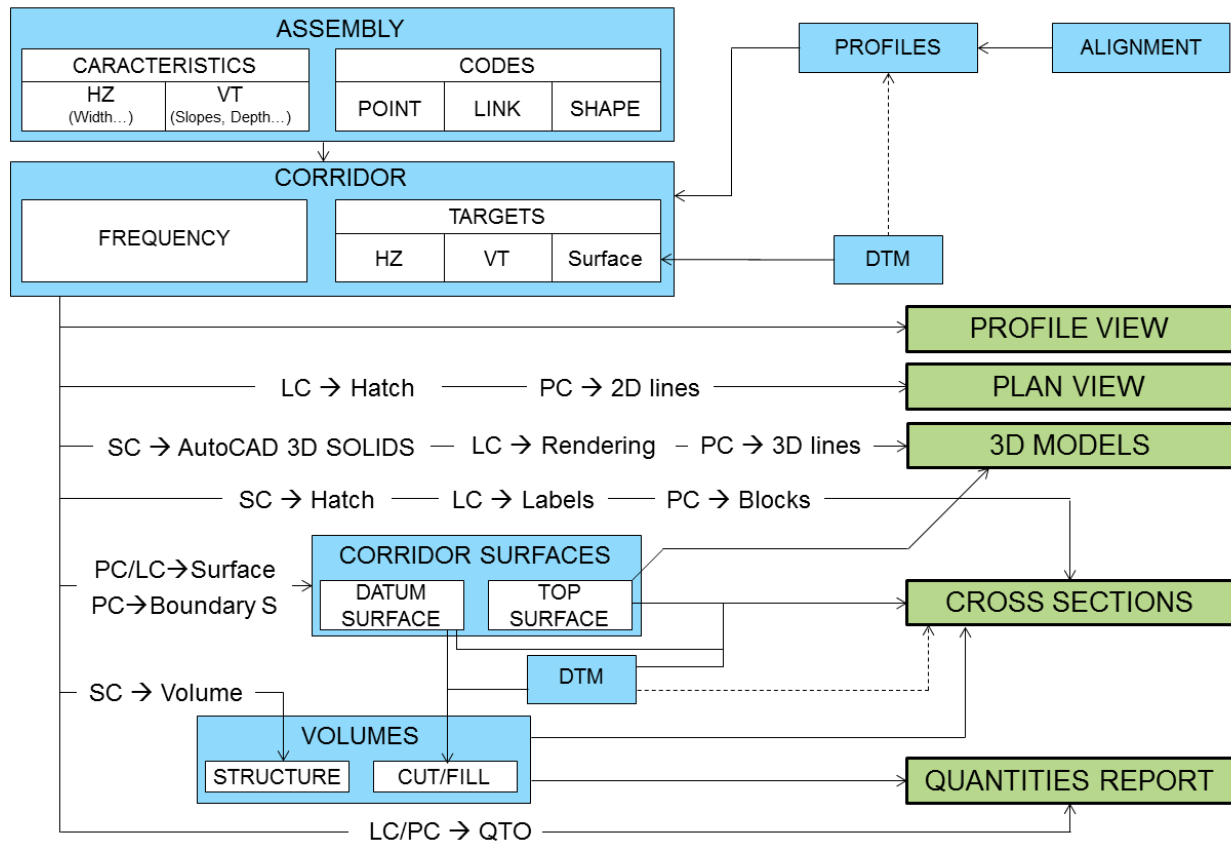


*EGIS CIVIL 3D LAUNCHER : BETWEEN AUTOCAD CIVIL 3D AND PROJECT REQUIREMENTS*



## The importance of an Assembly ...

Except Profile View, an Assembly has an impact on all deliverables.



## ... Impose the following rules ...

- First Rule

Less development during a Project, the more profitable the Project

- No lost time due to development work on the Project (Q.E.D.)
- The sub-assemblies are tested and approved in advance
- Standardized sub-assemblies means less time required for training

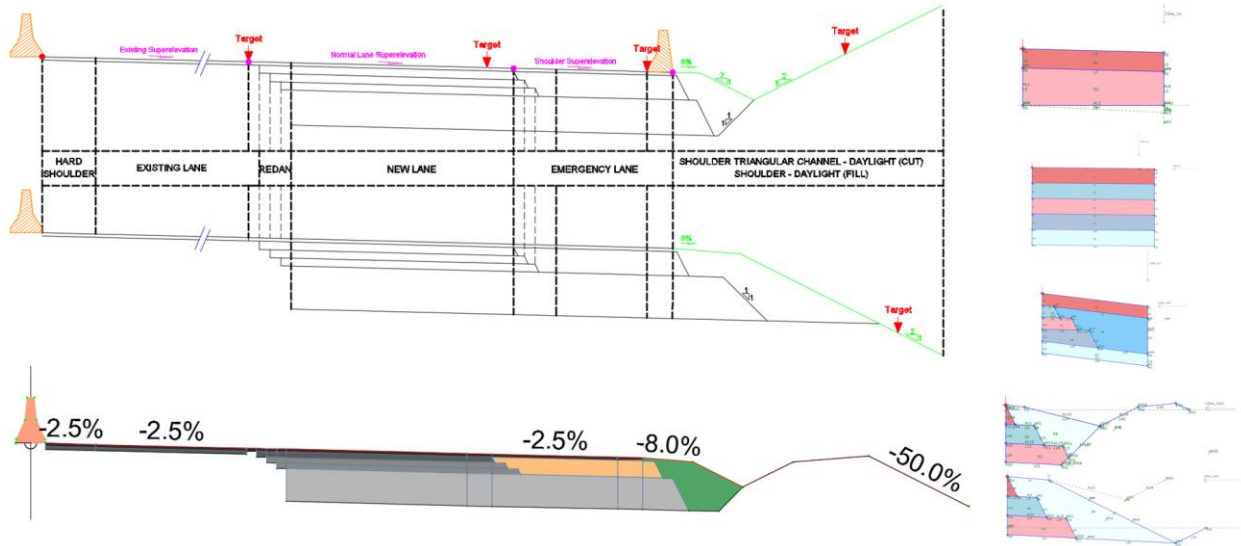
- Second Rule

The more liberty that is given in using/adapting the standardized sub-assemblies, less the temptation to recreate sub-assemblies from scratch



## ... and Development...

Like “Generic Sub-assemblies” from Autodesk, the idea is to develop as many generic Sub-assemblies by “Bricks” as possible. In the example below, 4 sub-assemblies only were used.



SAMPLE OF AN ASSEMBLY WITH FOUR COMPONENTS.

## Conclusion

It is important to separate the management of the standardization for Company Common Resources and the standardization of projects.

Egis Civil 3D Launcher is a solution that can be put in place at the beginning of a project, which assists the rapid and efficient evolution of the required resources as a function of the project needs.