# The Opening of Transportation Design Department In Purpose to Advancing the Human Resources and Economic Growth in Indonesia

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# BACKGROUND

Berangkat dari sarana transportasi di Indonesia khususnya di Jakarta yang sangat buruk, baik ditinjau dari prasarananya waupun sarana transportasi itu sendiri, maka pemerintah dalam hal ini instansi yang terkait dalam bidang transportasi sudah seharusnya membenah diri. Hal ini dapat dilakukan dengan pembenahan prasarana transportasi itu sendiri seperti :

- halte
- corridor jalan
- jaringan penghubung transportasi.

Disamping itu pembenahan terhadap sarana transportasi itu sendiri perlu diadakan revitalisasi / peremajaan fisik fasilitas seperti eksterior maupun interior agar penumpang umum maupun penumpang penyandang cacat yang mempunyai hak yang sama dapat merasakan kenyamanan dan keamanan didalam bertransportasi.

Sehubungan dengan itu, perlu adanya keterkaitan antara pengadaan transportasi itu sendiri terhadap peremajaan / revitalisasinya. Sehingga dalam hal ini diperlukan suatu media untuk perencanaan dan perancangan desain yang berhubungan dengan transportasi, yaitu Desain Transportasi.

Di negara-negara maju desain transportasi sangatlah diperlukan, tapi tidak berarti di negara berkembang seperti Indonesia tidak diperlukan. Seperti halnya Busway sebagai sarana transportasi, sedangkan prasarananya dapat kita lihat pada jalur corridor , halte dan jaringan penghubung transportasi umum lainya ( Transportation Networking ).

# REVIEWING PROBLEM

Kondisi prasarana dan sarana transportasi di Jakarta :

- Belum mempunyai standarisasi yang layak sebagai sarana transportasi angkutan umum.

- Penampilan prasarana dan sarana transportasi yang kurang memadai dan tidak layak

- Transportasi umum di Jakarta dan diluar daerah tidak mempunyai standarisasi dimensi / ukuran kebutuhan yang sesuai dengan faktor ergonomis (sebagai contoh pada sarana untuk fasilitas tempat duduk, handle, ruang / tempat penyandang cacat ,dan ruang / tempat meletakan barang bawaan yang besar)

- Nomor jurusan dan tujuan bis / kendaraan umum kurang informatif merepresentasikan pesan informasi kepada pengguna transportasi umum.

- Signboard didalamnya tidak / kurang memberikan informasi tujuan-tujuan bis / kendaraan umum yang melewati tempat tersebut.

# PROBLEM SOLVING

- Sebagai pendidikan yang berdiri didalam institusi Desain, hal ini menjadi suatu tantangan didalam permasalahan umum, khususnya dibidang Transportasi.

- Karena itu harus disikapi dengan perangkat keilmuan dibidang desain khususnya desain transportasi.

- Hal ini sangat penting untuk dapat menemukan solusi pemecahan, karena desain transportasi dapat bekerjasama secara internal dan eksternal didalam pelaksanaanya.

- Secara internal desain transportasi dapat bekerjasama dengan jurusan-jurusan desain lainnya seperti jurusan desain produk/industri, interior, fashion, Komunikasi Visual/Grafis, dan Seni Kriya.

- Keterkaitan hubungan ini dapat dilihat pada pelaksanaan desain sebuah transportasi umum yang membutuhkan revitalisasi / penyegaran didalam mendesain kendaraan transportasi. (Misalnya mendesain ruang interior untuk penumpang yang mengutamakan faktor kenyamanan dan keamanan yang sesuai dengan standarisasi kelayakan internasional, sehingga dapat bekerjasama dengan desain interior untuk kebutuhan ruang-ruang yang akan dimasukan didalam desainnya, seperti ruang tempat duduk, ruang tempat berdiri, ruang tempat penyandang cacat, dan ruang tempat bagasi dalam).

# PARADIGM OF TRANSPORTATION

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## The Growth History of Transportation

Transportation from time immemorial has been used in public life. Only conveyance is not what it is today.

Before the year 1800 transportation device used in human labor, animal and natural sources of energy. Transporting goods in small quantities as well as the time taken for a long time.

Between the years 1800-1860 has started expanding transportation harnessed mechanical energy sources such as steamship, railroad, which is widely used in world trade.

In the year 1860-1920 has been discovered aircraft motor vehicle, in this era of rail transport and highway plays an important role as well.
In 1920 transport has reached the level of development is at its peak (mature), the multimodal transport system (multimodal systems).

In the 20th century the booming growth of transport in line with the latest technological advances.

## The Meaning of Transportation

Transportation as the basis for economic development and community development as well as growth of industrialization.

## The Definition of Transportation

Transportation is the activity of moving goods (cargo) and passengers from one place to another. In transport seen there are 2 important elements, namely:

- Removal/movement
- Physically change the place of goods (commodities) and passenger to another place.

# The Function of Transportation

- Types of transport consisted of land transport, water transport, sea transport and air transport.

- Road transportation has two criteria. namely road transport and freight trains & monorails.

# PARADIGM OF TRANSPORTATION

## Framework of Transportation System

Transportation is a science that has much to do with other sciences, such as management, marketing, design, development, economics, law and government policy. In order to explore the science of global transportation management.

**The framework of transportation system**

| Effect of External Factors | | |
|---|---|---|
| **Legislation / Regulations** | **Setting / Wisdom** | **Service Users** |
| Public transport | Central Government | community |
| Private Car | Local Government | Industrial Company |
| Agreement for Transportation | | Government |

**Implementation / Execution Transportation System**

| Transportation System | |
|---|---|
| **Freight / Cargo** | Management |
| **Land Transport**<br>**Sea Transport (Shipping)** | Traffic Management |
| **Air Transport** | Transport management |
| **Pipe Transport System (Pertamina)** | |

**Transportation System**

The system used to transport goods by using certain conveyances called transportation modes (Modes of Transportation).

In use there are three modes of transport that can be used :

- Transportation by sea (Sea transportation).
- Transportation by road (rail, monorail, bus, truck).
- Transportation by air.

## Role of Transportation

Transport has a major influence on the individual, community economic development, and social politics of a country.

Transportation is a facilities and infrastructure for the country's economic development could push economic growth speed (Rate of Growth).

# ECONOMIC GROWTH

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**Economics & investment, transportation trigger**

The world economy began to squirm in 2010 after a recession in 2009. Positive economic growth. Unfortunately, a year later waves of the world economy took a critical wind pronged centered in Greece. Tail, other countries in Europe were affected. European economic crisis exposed deep enough.

In fact, the United States (U.S.) as an economic power, also has not yet improved. For the first time, the U.S. lost its AAA rating and unemployment is moving wildly. On the other hand, Japan still continues to struggle with the tsunami disaster crisis that accompanied the political crisis. Unprecedented in modern history, three of the four largest economies in the world are in a state that is so alarming.

Fresh breeze was blowing in 2012. There are opportunities to grow, but not too strong. There is still hope that the world economy will not be sunk deep in 2008-2009.

In the midst of the recession in 2009, there are some countries that are immune. They keep growing, including Indonesia (4.6%). In fact, India (7.0%) and China (9.2%). Indonesia actually improved.

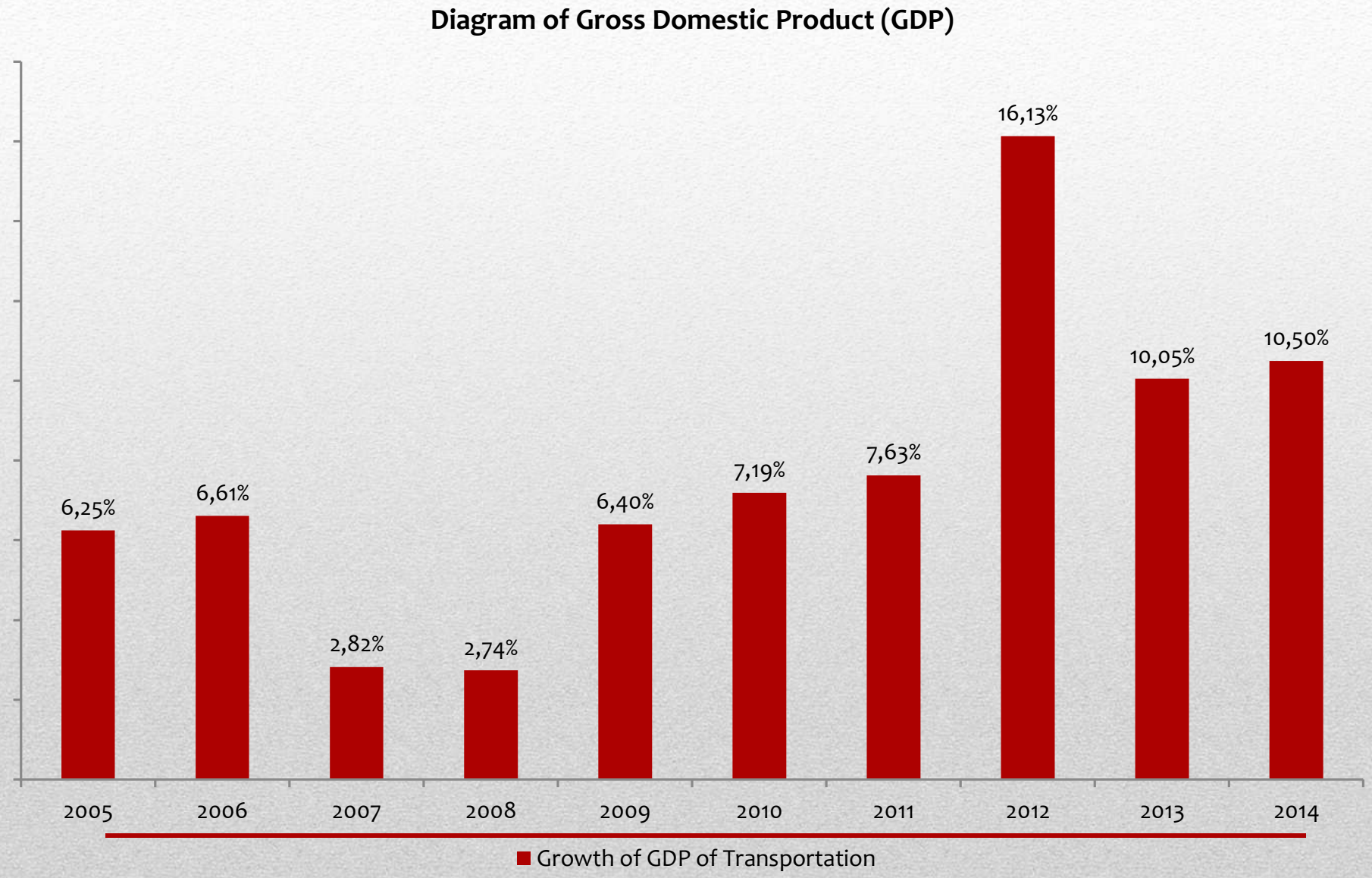
In 2010 and 2011 grew 6.1% and 6.5%. Economic growth in Indonesia, along with India and China, is projected to remain high and economic growth is higher than other giants. Indonesian macroeconomic conditions are strong engenders trust.

Since 2009, the leading international ranking institutions, namely Fitch, and Standard and Poor's, has increased Indonesia's Sovereignty Rating (regardless of global economic uncertainty) to only 1-2 levels below investment grade. Indonesia is considered to have a stable future. The proof, climbed Indonesia's sovereign rating to BBB-by Fitch, in the category of investment grade.

In fact, in January 2012, Moody's rating has increased investment Indonesia to investment grade level ranking after losing it during the 14 years since the 1998 financial crisis. UNCTAD survey conducted in 2009, showed that Indonesia occupied the number one of the 10 countries with the greatest attraction for foreign direct investment (FDI). In the ranks of the ASEAN countries, Indonesia defeated Thailand, Malaysia and Vietnam.

# ECONOMIC GROWTH

GDP growth in the Transportation Sector
(source: Central Bureau of Statistics 2012 and the Ministry of Transportation, 2011)



# ECONOMIC GROWTH

Transport development should be integrated in the economic development of Indonesia. The focus of economic development in the past are likely in the financial sector should begin to be balanced with the development of the real sector through the development of infrastructure including transport. The key is to find the optimum balance point between the financial sector and the real sector.

Transportation is a necessity derivative (derived demand) due to economic activity, social, and so on.

National transport should be managed with software (software), equipment (hardware), and the power of thought (brainware) which has world-class standards (world class), resulting in a performance that compete at the global level.

Transportation system should be viewed as the glue of the nation and the state. Road network from Sabang to Merauke, from Sangir Talaud to Kupang, is the glue of the Republic of Indonesia.

## Transportation as a Supporting Economic Development

- Economic development requires adequate transportation services and adequate.

- The level of economic development, in order to construct a national transportation system or in setting national transportation policy must first determine the objectives which require transportation services in the national transportation system.

- The goals to be achieved in economic development are:

- Increasing national income
- Increase the type and amount of goods and services that can be produced by the consumer, industry, and government
- Develop a national industry that can generate income as well as to supply the domestic market
- Creating and maintaining levels of employment opportunities for the community.

Transportation plays an important role in achieving the goals of economic development is.

## Transportation for the Economic Infrastructure

Transport function is to transport passengers and goods from one place to another. Passenger transport demand depends on the function for one purpose (personal place utility). One can take a trip to the need for personal or business purposes.

Economic needs of the factors, which are associated with the transport of some kind of goods, depending on the nature of the goods and usability rather than economic.

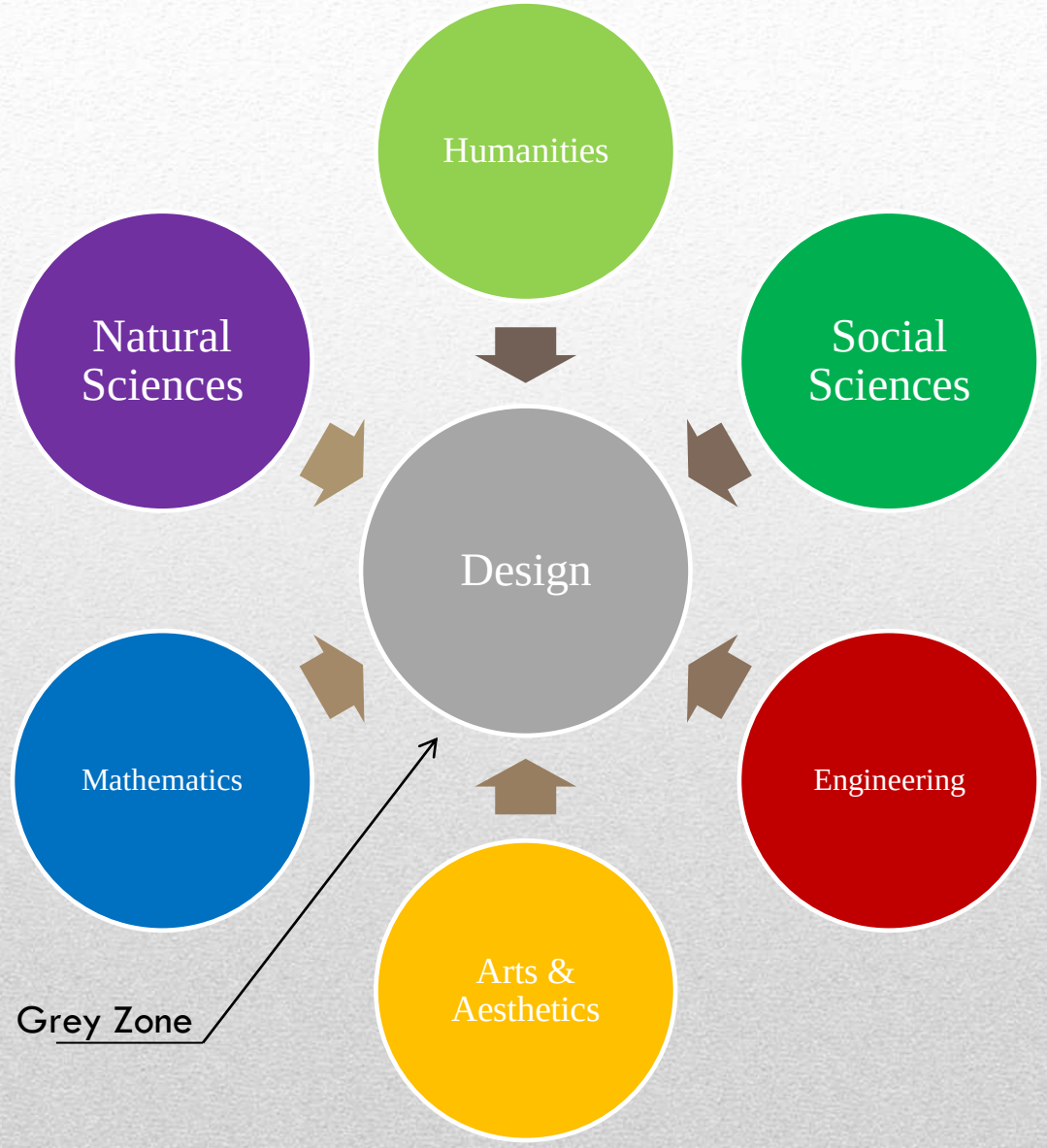
So the transportation utility creates a place (place utility), with transporting a particular type of goods from one place to another in order to be used in the place in question.

# DESIGN METHODS

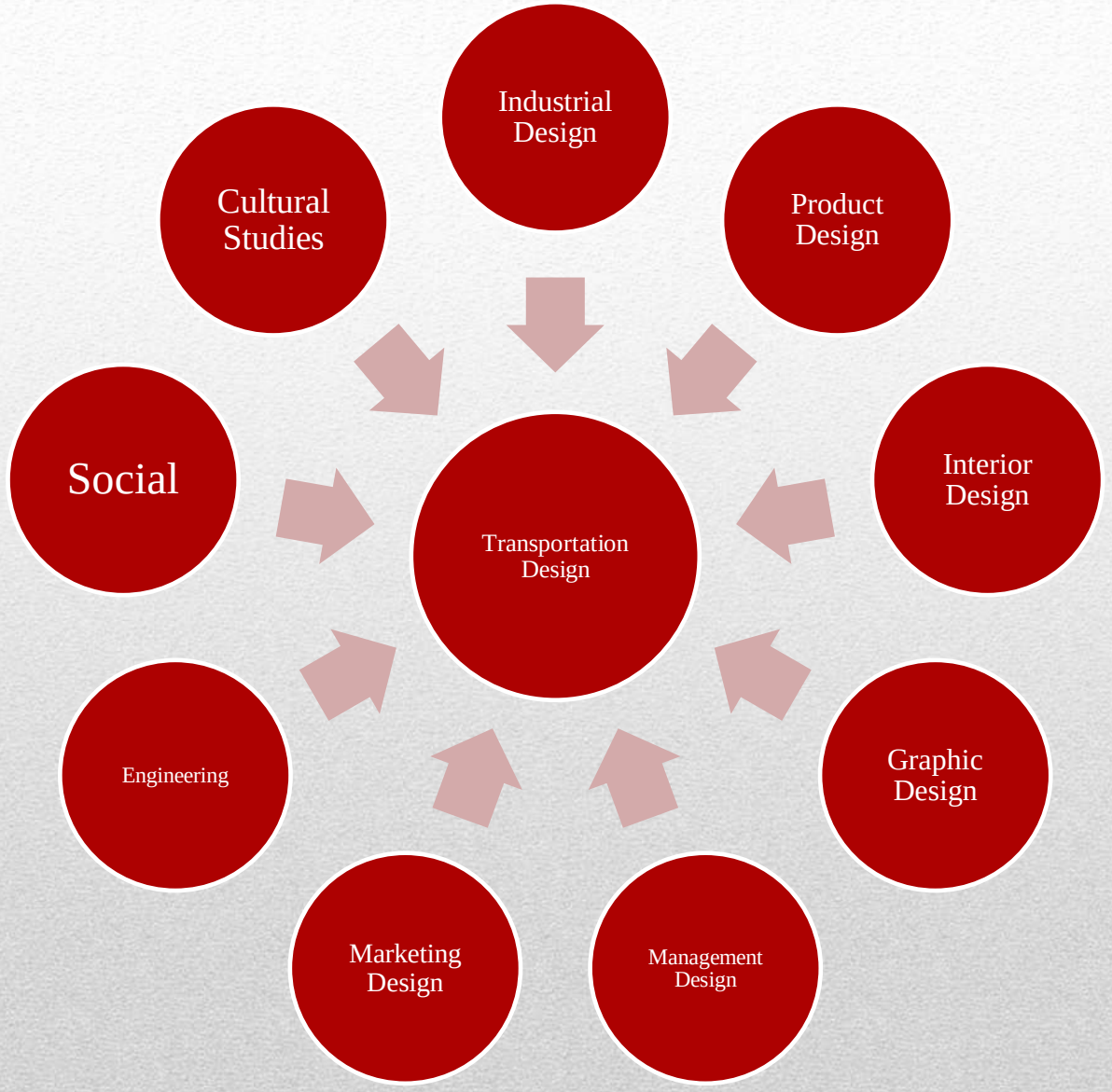
## Design Epistemology

As a branch of science, design science is not an autonomous science, which is sufficient in itself, but it is a science that is built through borrowing from various educational backgrounds.

In other words, the science of design built by an 'architectural knowledge' that combines a variety of scientific fields other loans, either directly or indirectly (through consultation) as a unified science of design.




**Scheme of interdisciplinary of design knowledge**




**Scheme of interdisciplinary of transportation design knowledge**

It can be said, that the special characteristics of the design and design sciences is interdisciplinary nature, involving many other branches of science, in particular the intensity and the special form. Such as design science that covers the science of industrial design / product (furniture, toy, electronic, fashion, jewelry, home appliance), the science of graphic design / visual communication (typography, semiotics, computer graphics), the science of interior design (zen, spaceroom), and the aesthetics of art and sciences.

While in transportation design, involving the design of a variety of other scientific branches. Like a mixture between product design science/industrial, interior design science, the science of graphic design/visual communications, and the combination of management science, engineering science, marketing science, social sciences, philosophy, history of science, and computer science.

**Design Knowledge**

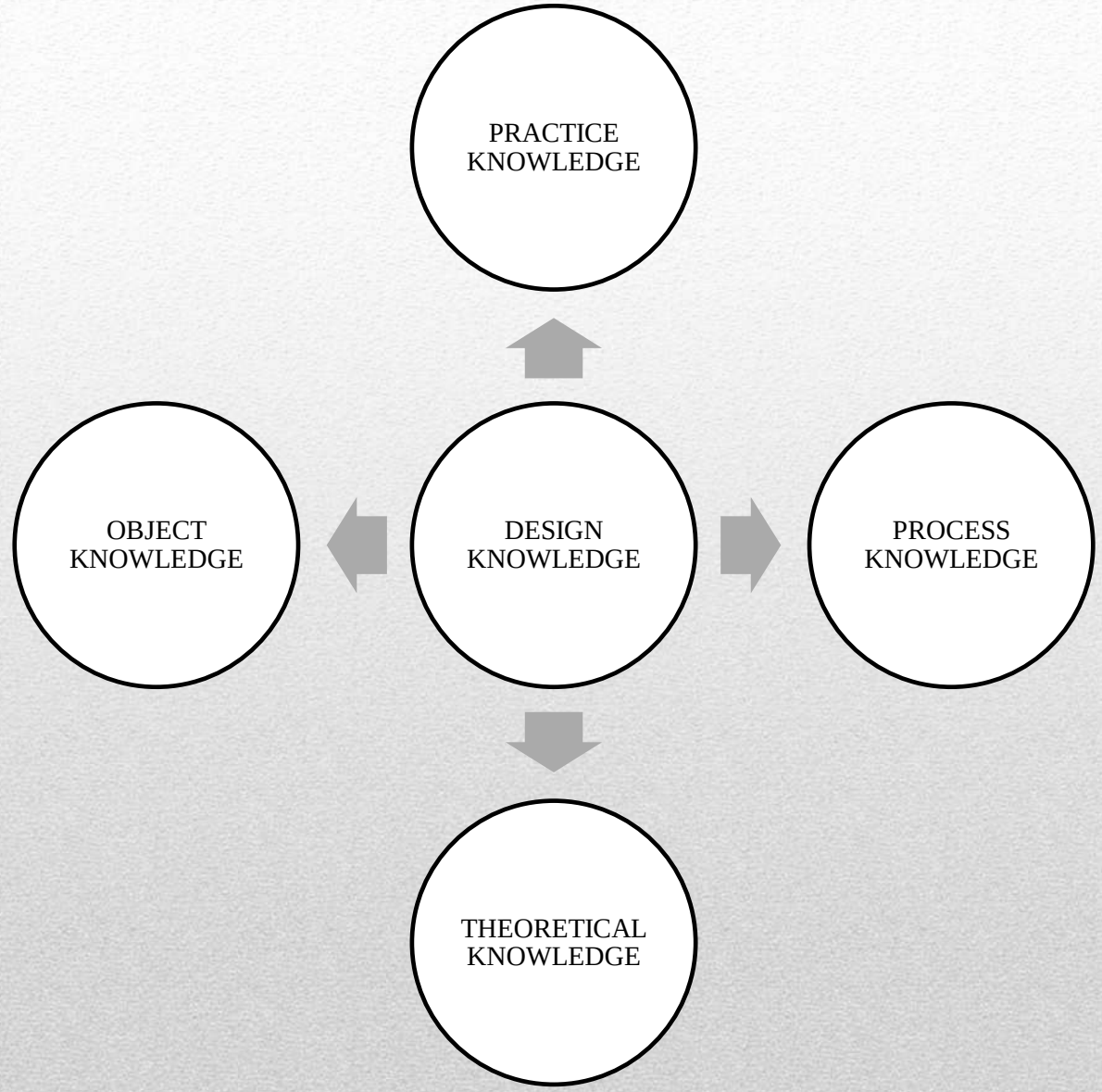
Design knowledge can be divided into four categories of knowledge :

(1) knowledge of the design object, namely knowledge of the system, the composition, structure, physical quality and the shape of the object

(2) knowledge of practical design, the knowledge of usability, functionality and utility objects

(3) knowledge of the design process, namely knowledge of the methodology of design, process design, process of production and consumption, and

(4) knowledge of design theory, namely knowledge of the various theoretical aspects of design, both the theory of object it's itself (philosophy design), dimension mental (psychology design), dimensions exchange of (economics design), social dimension (sociology design) and dimensions aesthetic (aesthetics design).




**four categories of design knowledge**

**Approach of Methods**

Approach in designing the method of transportation is the entrance or point of view used in the object and understand the problem. There are three approaches in the design of transportation science, namely:

Sciences Approach

Approach to science (nature) intended to acquire objective knowledge, the rational knowledge that builds upon the strengths of rational reasoning against empirical data.

Cultural Studies Approach

Cultural Studies is a new approach in the study design, the principles, rules and specific methods.

Aesthetic Approach

Aesthetic approach is a special approach that emphasizes the aspects of art and design in relation to the aesthetic appeal (aesthetic appeal).

# ACADEMY

**Lectures**

Lectures speaking on a characteristic / spesific topic to provide a good overview of whole subject areas. Students complement their knowledge by personal study and reading. The vitality of a lecture depends on the topic and on the lecturer's rhetorical skills. It is not usual for there to be any exchange or discussion between lecturer and students during a lecture.

As a lecturer of transportation design, the lecturer who can teach in this field can be extracted from a background of interior design, industrial design/product design, graphic design/visual communication design, digital design, management, philosophy, social, cultural, marketing, and engineering.

**Transportation Design Curriculum**

The transportation design department has recognized this swift, as well as the need to create compelling, integrated transportation systems that complement the automobile as a method of mobility.

The department accordingly equips students with the skills and knowledge to provide creative leadership on these issues within the automotive and transportation industries and to take advantage of emerging opportunities in the wider field of transportation design and planning.

In the first four terms, students develop fundamental skills, including concept sketching, rendering, 3D model making, and presentation techniques. Principles of ergonomics, mechanical engineering, material technology, emerging technologies, and energy sources, plus the use of computer aided design tools, are also taught. In later terms, students simulate professional activity by completing projects sponsored by domestic and international companies in collaboration with leading professionals. The faculty encourages students to become individual thinkers with the confidence and ability to challenge the status quo and present innovative, original ideas.

| Transportation Design Curriculum | | |
|---|---|---|
| **Term 1** | Development of Form | 3 |
| | Design 1 (FND) | 3 |
| | Model Contruction 1 | 3 |
| | Visual Communication 1 | 3 |
| | Perspective (FND) | 3 |
| | English Composition (LAS) | 3 |
| **Term 2** | Transportation Design 1 | 3 |
| | Industrial Design 1 | 3 |
| | Model Construction 2 | 3 |
| | Visual Communication 2 | 3 |
| | Digital Design 1 (DM) | 3 |
| | Introduction to Modernism (LAS) | 3 |
| **Term 3** | Transportation Design 2 | 3 |
| | Industrial Design 2 | 3 |
| | Model Construction 3 (FND) | 3 |
| | Visual Communication 3 | 3 |
| | History of Automobile Design (LAS) | 3 |
| | Designer Math (LAS) | 3 |
| **Term 4** | Transportation Design 3 | 3 |
| | Industrial Design Graphics 1 | 3 |
| | Visual Communication 4 | 3 |
| | 3D Object Modeling 1 (DM) | 3 |
| | Human Factors & Design Psychology (LAS) | 3 |
| **Term 5** | (Choose) Advanced Transportation Design 1 or Mobility Design 1 | 3 |
| | Vehicle Architecture | 3 |
| | Visual Communication 5 | 3 |
| | 3D Object Modeling 2 | 3 |
| | Automotive Engineering (LAS) | 3 |
| **Term 6** | Advanced Transportation Design 2 or Mobility Design 2 | 3 |
| | (choose) Transportation Interior Design or Transportation System | 3 |
| | Design Management 1 | 3 |
| | 3D Transportation Design | 2 |
| | Visual Communication 6 | 3 |
| | Materials & Methods 1 (LAS) | 3 |
| **Term 7** | Advanced Transportation Design 3 or Mobility Design 3 | 6 |
| | Automotive Product Planning | 3 |
| **Term 8** | Advanced Transportation Design 4 or Mobility Design 4 | 6 |
| | Required Units | 116 |
| | Additional Elective Units | 28 |
| | Total Units | 144 |

**DM : Digital Media**

FND : Foundation Studies

LAS : Liberal Arts and Sciences

TDS : Trans-disciplinary Studio

**The offering of transportation design curriculum for Indonesia (the growing country)**

Mobility has taken on a whole new meaning. It's not just about cars anymore, but entire transportation systems and strategies.

From the Curriculum of University of Esa Unggul, Faculty of Design & Creative Industries, Department of Product Design, majors already have specialization subjects, namely transportation design and industrial design. Particular specialization in transport design is in great demand by students of the University of Esa Unggul, product design. Students are excited about taking the course obstacle courses seldom thrusts towards majoring in transportation design in the product design itself.

Jeff King (Bentley Motors) from U.K has a statement "The most important skill-set that the transportation graduates acquire is the perfect mastery of the conceptualization process, in project teams, with up-to-date digital tools". The meaning is, the students who learn this knowledge, always understanding of teamwork, share the idea from each other, and always follow the use of technology (such as wacom, computer, 3D software, etc).

**Graduate Degree**

The graduate degree (title) of this program is depending from the University/college/institute who brought the program to the qualification. In the International University (such as Art Center : College of Design), students who graduates the design program should be given as 'B.Sc' (means Bachelor of Science), for all design program (product design, multimedia, transportation, etc). The same way as post-graduate programs do, given with 'M.Sc' (Master of Science).

In Europe, especially in Italy, Instituto Europeo di Design gave the title of transportation design program is more specific, there should be 'MTD' (Master of Transportation Design), 'MYD' (Master of Yacht Design), and more some.

Honestly, it is good if we follow the same path. Just like Art Center and Instituto Europeo di Design did. But in Indonesia, The "Knowledge of transportation design" is too few, even there was adequate lecturer for now.

For the first step, Indonesian students who taken the scholarship of this program, it should given with a title S.Des (Sarjana Desain), S.Dt (Sarjana Desain Transportasi) or S.Si (Sarjana Sains). Or anything who can match it and supported.

**The Output**

The students who has graduated from transportation design department, can be worked at Automobile company, Car of series (karoseri), military mobility, sea transport company, Adhikarya Jakarta Monorail, Angkasa Pura, Locomotive Company, Air Company, and many more.

Moreover, they actually can work in other design firm. As long as it design industry (industry means product such as transportation, furniture, electronic, toy, jewelry, fashion, footwear, home appliance, etc), transportation design degree is more higher knowledge from other industrial design knowledge. Because it includes of interior, furniture, electronic, aesthetic, engineering, computer aided design and exterior form.

# GALLERY

# GALLERY

This is the gallery of transportation design department & knowledge, it can brings a new atmosphere and a new spirit for the students of Indonesia, and the overseas students who wants join to our class.

Design Studio of Transportation Design Class in University of Esa Unggul

Workshop of Transportation Design Class in University of Esa Unggul

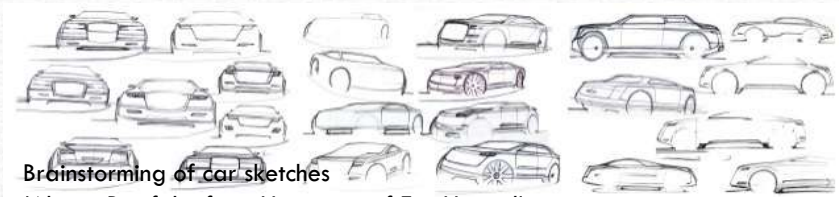
Gallery room for transportation design events

Classroom atmosphere

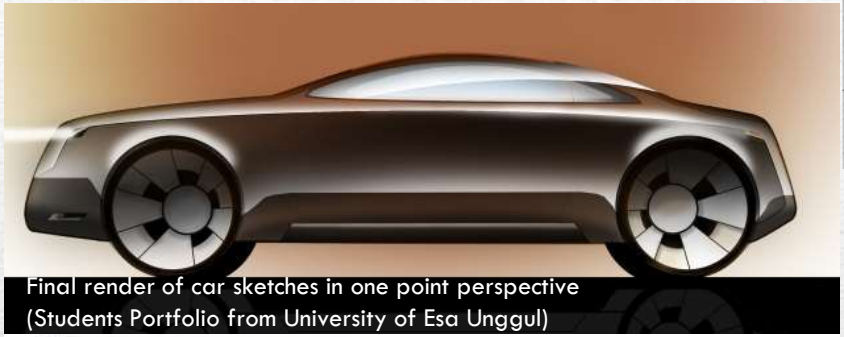
The atmosphere of 3D Studio at University of Esa Unggul

Classroom in Sketch Studio at University of Esa Unggul

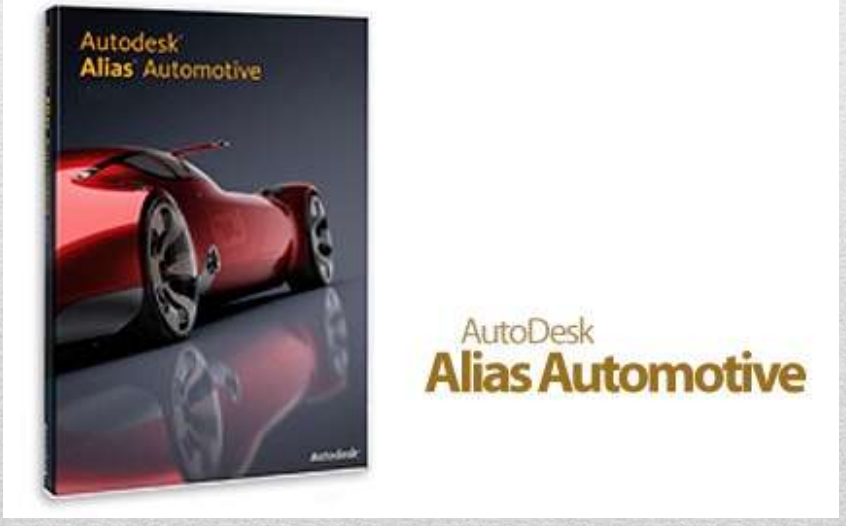
Entering digital rendering with wacom technology



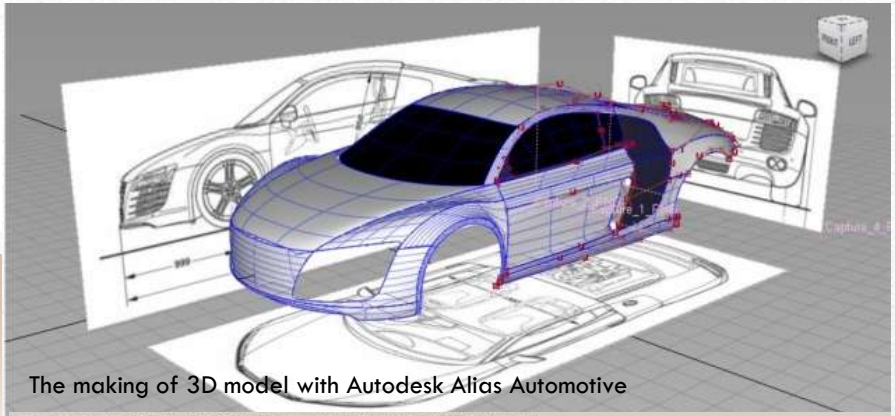
Brainstorming of car sketches
(Alumni Portfolio from University of Esa Unggul)



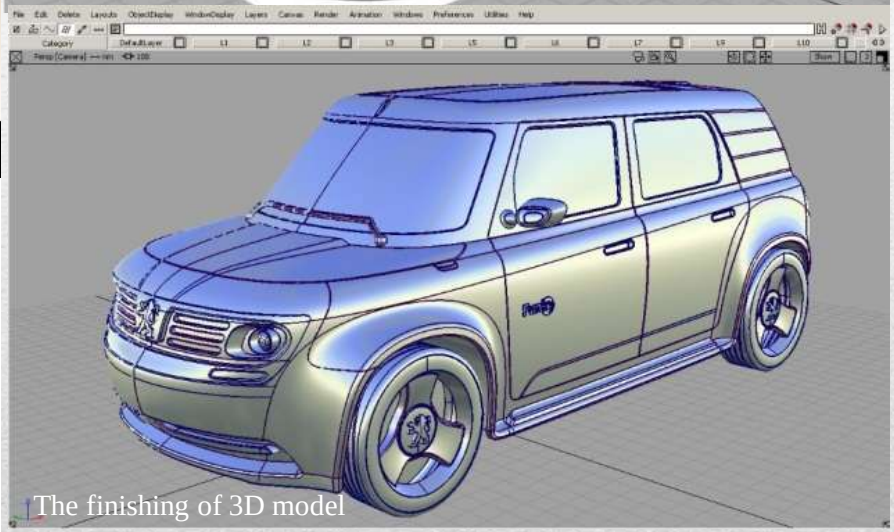
Final render of car sketches in one point perspective
(Students Portfolio from University of Esa Unggul)




The software of transportation design, Autodesk Alias Automotive



The making of 3D model with Autodesk Alias Automotive



The finishing of 3D model

Realistic of Photometric Render (Lecturer portfolio in University of Esa Unggul)

Tape Drawing for scale 1:1


The Display of Final Presentation

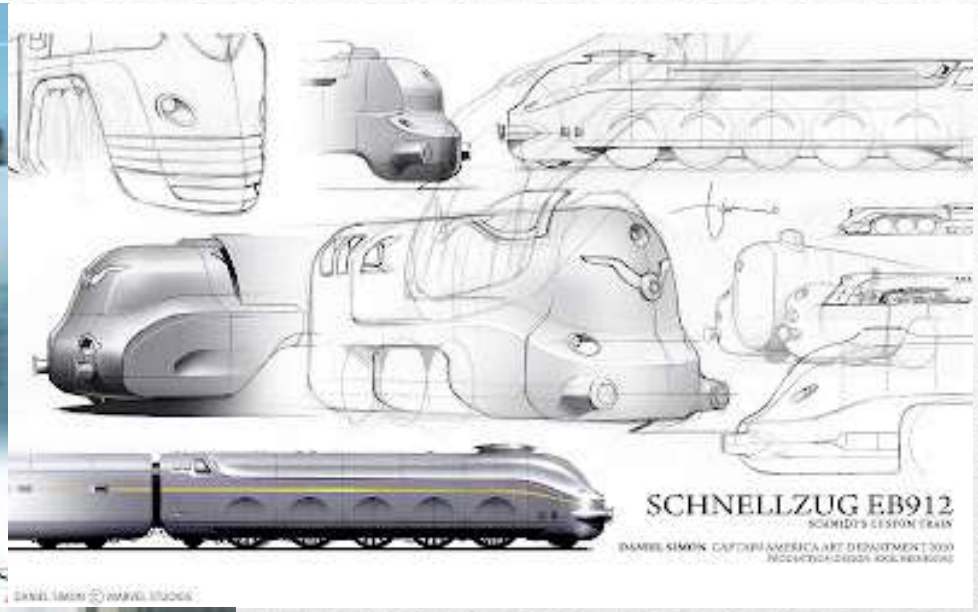
Mock-up design

Presentation in front of stakes-holder

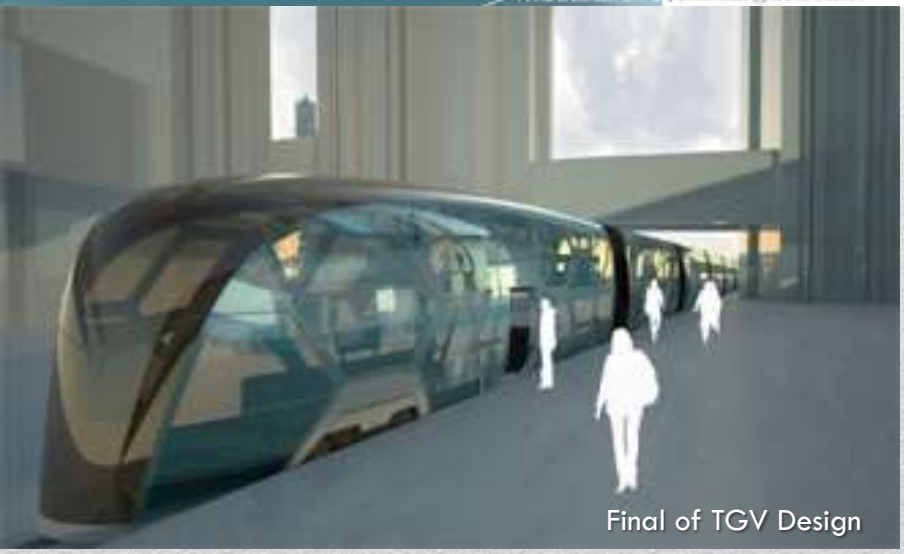
Vacuum Modeler

The Display of Final Project

Sea transport design




Train sketch design by Daniel Simon



Final of TGV Design

# CONCLUSION

Indonesia is a potential country to build our nation transport, the government must support and trust to our next generation people. We must do to open the single department (program), which is the department of transportation design. We have adequate lecturers from this knowledge, we have lecturers graduates from overseas, and we have transportation experts, specialist and engineering. We ready to share and give the knowledge to the students who want learns this knowledge to build a new future for Indonesia especially in transportation sector.

Department of Indonesian Education must announces about this and give the support to us who wants open this program.

# THANK YOU

This is one of my Portfolio (Transportation Design)

You can see my work at : www.geggystudio.carbonmade.com