

Lecture #1:

* Definition of Transportation Engineering:-

→ A branch of civil Engineering which is concerned with the safe and efficient movement of people and goods in an environmentally friendly manner.

* **Efficient:** rapid, economical, convenient, comfortable,

* **Environmentally friendly manner:**

- minimize air, water, soil and noise pollutions and vibration.

* Transportation is a multi-disciplinary Approach:

→ math, statistics, probabilities

→ (Micro, macro) Economics

→ Graphics and Technical drawing

→ Surveying.

→ Geology, soil, foundation, pavement design.

→ Structures, especially bridges, terminals.

→ Materials: soil, base course asphalt, concrete mix

→ Drainage **الهداية** design

→ Construction

→ Environment impact

→ Psychology → **العلم النفس**

→ Sociology ,, → law ,, → Technical Writing

- Electrical (Street lights and traffic lights)
- Mechanical Engineering, Vehicle movement
- Management, إدارة (الطيران في الجو، الباصات، ...)

**** توضيح لكل الكلام والمجالات:**

إنه هندسة المواصلات تشمل العديد من المجالات والاختصاصات
 بعكس باقي تخصصات الهندسة المدنية، فمثلاً التركيز الإنشائي متخصص
 بالإنشاءات، السوييل متخصص بالتربة وهكذا.

*** The sequence of the Transportation Engineering Process (for all modes):**

*** تسلسل عملية هندسة المواصلات:**

① Planning: The transportation planning process

② Design: * Geometric Design

* Pavement Design

* Structural Design

* (Mechanical/Electrical) Design

③ Construction: Traffic related aspects (detouring/safety)

انقطاع الجوانب المتبقية بالزور
التفاف

④ Operation: Traffic Engineering studies, sign, marking, signals, etc

Sea ports: موانئ بحرية

→ Maintenance: ^{أعمال صيانة} pavement, signs, structures, electrical ^{وصف} mechanical, grass mowing, ... etc

* The importance of Transportation:

① * The progress of communities: ^{تقدم المجتمعات}

→ cities built as sea ports: (e.g. London, Rome, Amsterdam, Athena, New York, Philadelphia, Cairo, (all north africa), Tokyo, Shanghai, and Sydney (all Australian cities)).

→ ^{طرق برية تجارية} Land trade routes: Mecca, Nablus.

→ Railroads: Chicago, Indianapolis.

→ Other importance cities: fortresses (mountains, far from trade routes e.g. (Jerusalem, Madrid, Beijing)).

② * Renovation of cities: (e.g. Washington DC Metro) ^{تجديد المدن}

③ * Economics development: ^{مواد خام} (raw materials, manufacturing, ^{تصنيع} consumption) ^{استهلاك}

④ * Way of life (private vehicles, public transit, work methods, work hours.)

→ Comparison between USA and Europe

* settlement routes: طرق المسوّطات

* Objectives of Transportation:

→ Movement of people and goods in an efficient, safe in environmentally compatible methods.

→ Economic development: * place utility (raw materials, industry) Consumers. ^{اقتصاد} _{سكان المنطقة المستهلكين}

* time utility (Christmas trees, Ramadan) _{Haji items}

* Quality utility (Kashmiri apples to reach) _{Bombay}

→ Social and culture development:

→ Political objectives (settlement routes in Palestine)

→ Military routes (The Roman Empire, US interstate and defense) _{system}

نظام الدفاع بين الولايات

* Main concerns of Transportation Worldwide:

→ Congestion

→ Safety

→ Land, labor, Capital, energy, time consumption

→ Environmental impact

→ Social equity _{عدالة اجتماعية}