

Lecture #4

* Stopping sight distance:

① Assume $G = 0$:

Metric النظام المتري	US Customary وحدة قياس أمريكية
$d = 0.278 Vt + 0.039 \frac{V^2}{a}$	$d = 1.47 Vt + 1.075 \frac{V^2}{a}$
where: t: brake reaction time, (2.5s) d: design speed, (Km/h) a: deceleration rate, (m/s ²)	where: t: brake reaction time, (2.5s) d: design speed, (mph) a: deceleration rate, (ft/s ²)

② Effect of grade on stopping:

Metric	US Customary
$d = \frac{V^2}{254 \left[\left(\frac{a}{9.81} \right) \pm G \right]}$	$d = \frac{V^2}{30 \left[\left(\frac{a}{32.2} \right) \pm G \right]}$

* Urban Public Transit:

→ Person (passengers) capacity: 22A ①

* 1 lane street : $1 * 1200 * 1.1 = 1320$ person/hr
 (PC/lane) capacity
 passenger car
 Car occupancy

* 1 lane Street : $1 * 1200 * 2.5 = 3000$ person/hr
 (car pooling incentives)

* 1 lane highway : $1 * 2000 * 1.1 = 2200$ person/hr

* 1 lane highway : $1 * 2000 * 2.5 = 5000$ person/hr

* Shared taxis street : $1 * 1200 * 7 = 8400$ person/hr
 شارع سيارات الأجرة المشتركة (loading and unloading, stops, safety, pollution)

* Reserve bus lane : (50 person/bus) * (800 bus/lane)

← 40000 person/hr
 (loading and unloading, fare collection)

→ 400 50 * (400 → 500) bus/lane = 20000 → 25000 person/hr

نوع من القطارات
↗

$$* \text{Trams} : 300 * 20 = 6000 \text{ person/hr} + \text{benefits}$$

(safety + Environment + reliability)
+ comfort

مستوف

$$* \text{LRT} : 500 * 20 = 1000 \text{ person/hr}$$

$$* \text{RRT} : (2000 \text{ person/train}) * (20 \text{ train/hr})$$

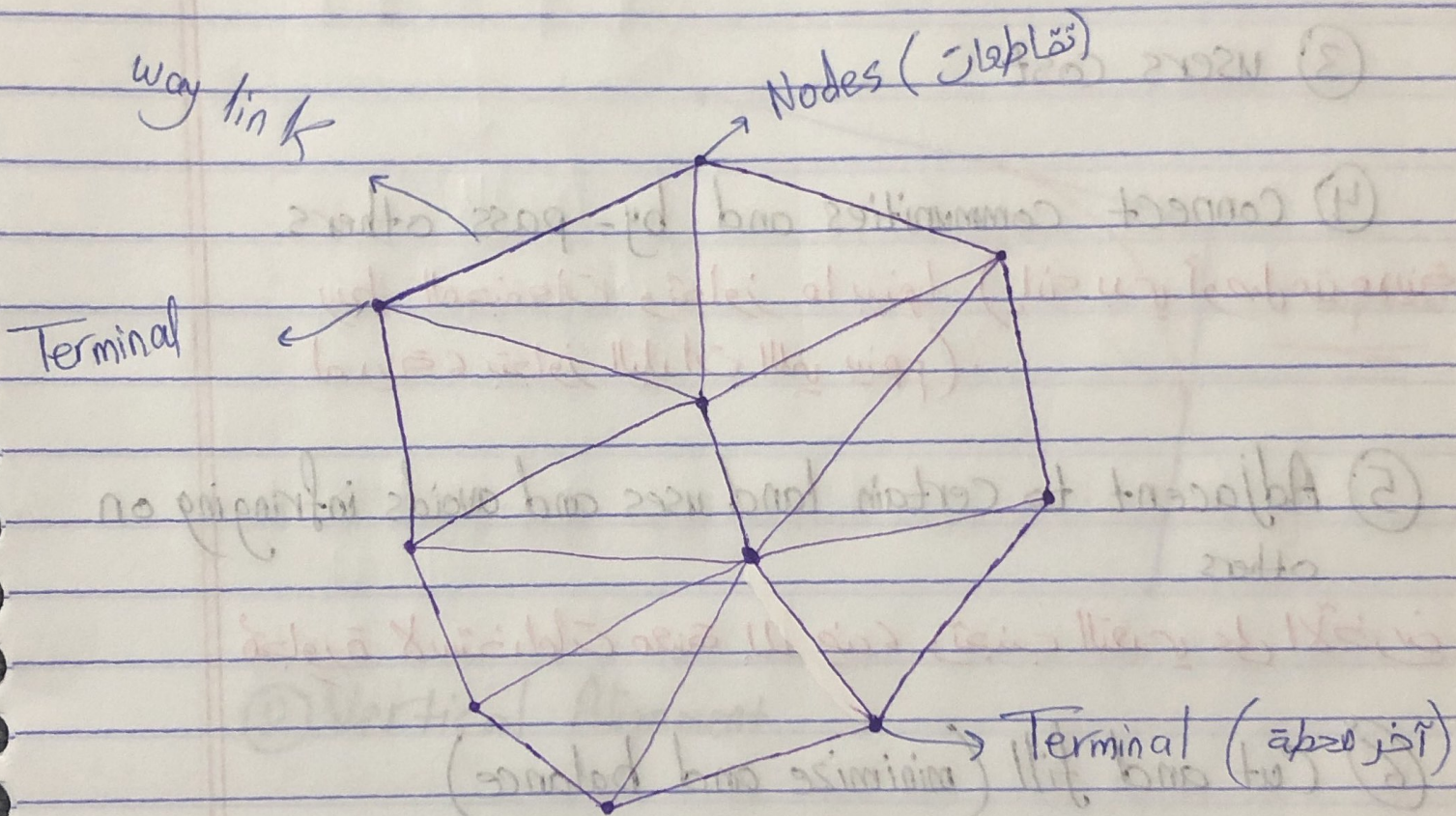
$$= 40000 \text{ person/hr}$$

(3 minutes headway), fare collection
, loading and unloading efficiency

Ch. 12: Land Transport: Highways and Rail Roads

* Transportation Network consist of:

- ① way links
- ② Node
- ③ Terminals



"Transportation Network"
for all modes of transportation

* قد تبدأ بـ terminal وتنتهي بـ terminal

تتعلق بالطائرات والقطارات والسفن

* Highway or Rail Location is a function of:

① Distance (minimize distance)

② construction cost

③ users cost

④ connect communities and by-pass others

ربط المجتمعات وتجاوز ما بينها (إذ به يوصل من مدينة
لمدينة بتجاوز البلدات التي بينهم).

⑤ Adjacent to certain land uses and avoids infringing on others

تجاورة لاستخدامات معينة للأرض، وتجنب التقدي على الآخرين

⑥ Cut and fill (minimize and balance)

⑦ Design consideration: minimum curve radii and maximum slopes allowed

⑧ Soil and materials considerations

⑨ Environmental impact ,, ⑩ Social impact

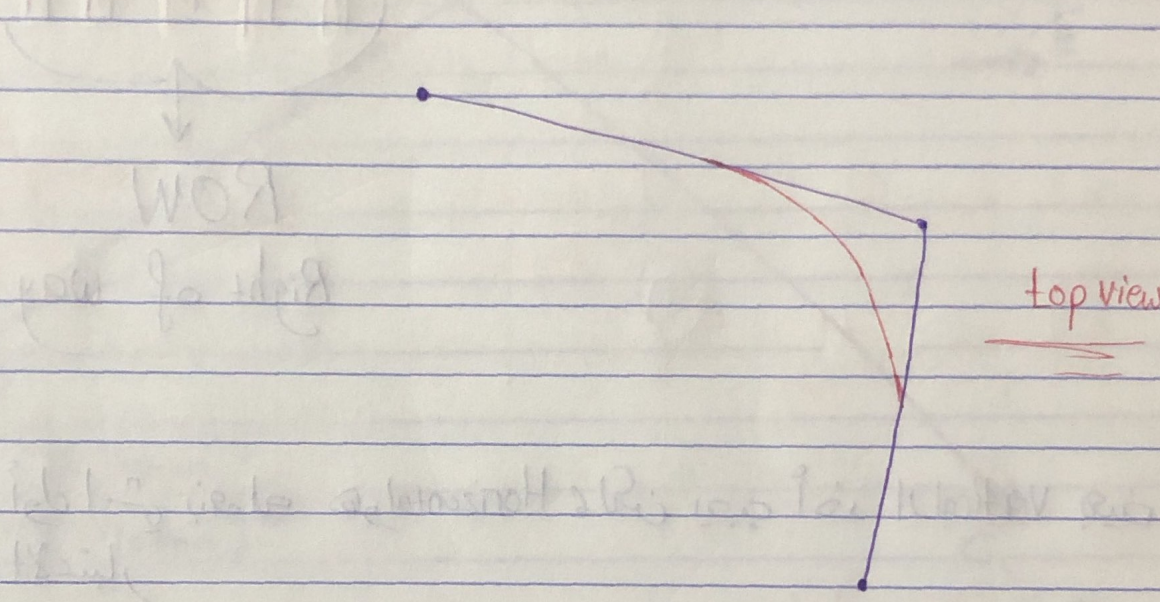
* trade-off بيننا لتسوف شو أفضل اسي .

and Rail Roads

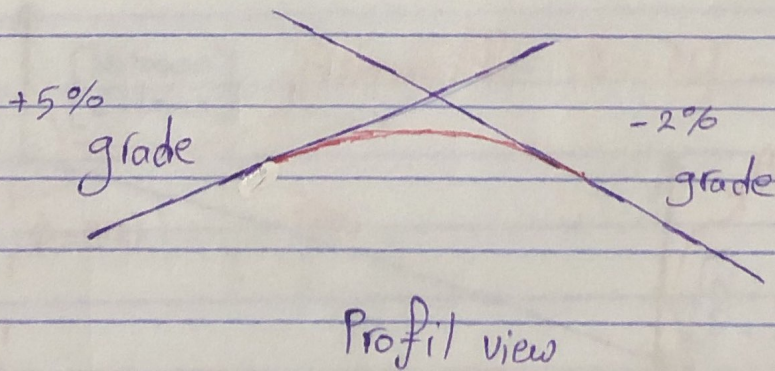
* In Highways there is (1) (2)

* Geometric Design:

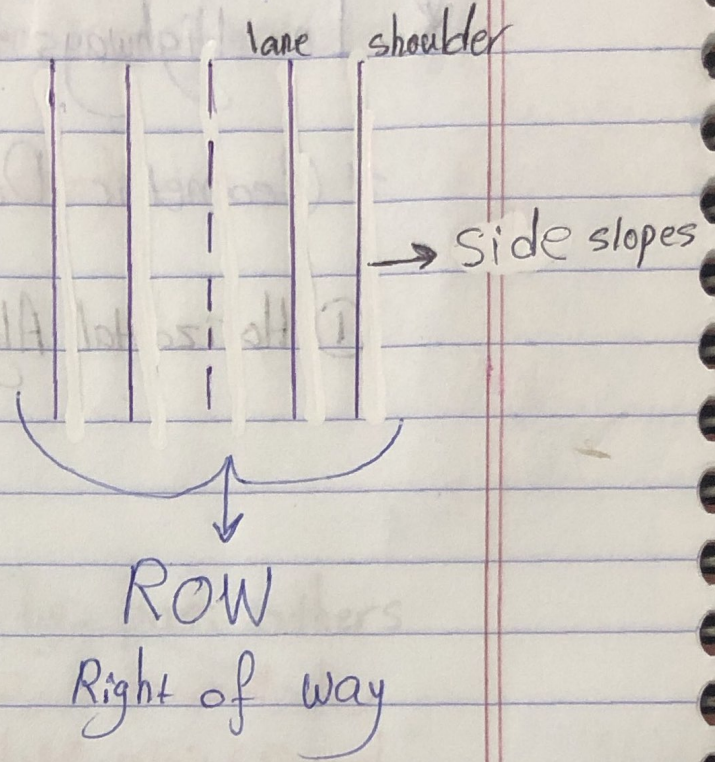
① Horizontal Alignment:



② Vertical Alignment



③ Cross-section



* أول شيء ينظره هو Horizontal ولكن يجب أخذ ال Vertical بعين الاعتبار

② Vertical Alignment

