

Progress Report

2019-05-21(二)

- 1.Send time schedule
- 2.Simulation of one vehicle with multiple tasks
- 3.Comparision of the two method in receiver's request

	v1	v2	v3	v4	v5
09:30				sender6	
10:00	sender1	sender2			sender8
10:30			sender4	sender7	
11:00		sender3			
11:30			sender5		
12:00					sender9

CarsMapWithSchedule:
 {1=[600], 2=[600, 660], 3=[630, 690], 4=[570, 630], 5=[600, 720]}

v5_TimeToSenderInfo:{
 720=[306997497#0, 1738.11, 1029.69],
 600=[228022809#9, 1530.12, 2028.92]}

sender9_Array:[306997497#0, 1738.11, 1029.69]

At 09:00:30,
we got send-Request10 of 10:00 (10hr=600mins)

	v1	v2	v3	v4	v5
09:30				sender6	
10:00	sender 1	sender2	sender10	sender10	sender 8
10:30			sender4	sender7	
11:00		sender3			
11:30			sender5		
12:00					sender 9

Vmax=5 [m/s]=18 [km/hr]

Distance_v3toSender10:**1435** [m]

Distance_Sender10ToSender4:**2286**[m]

v3 is the candidate!

Distance_Sender6ToSender10:**719** [m]

Distance_Sender10ToSender7:**1242** [m]

v4 is the candidate!

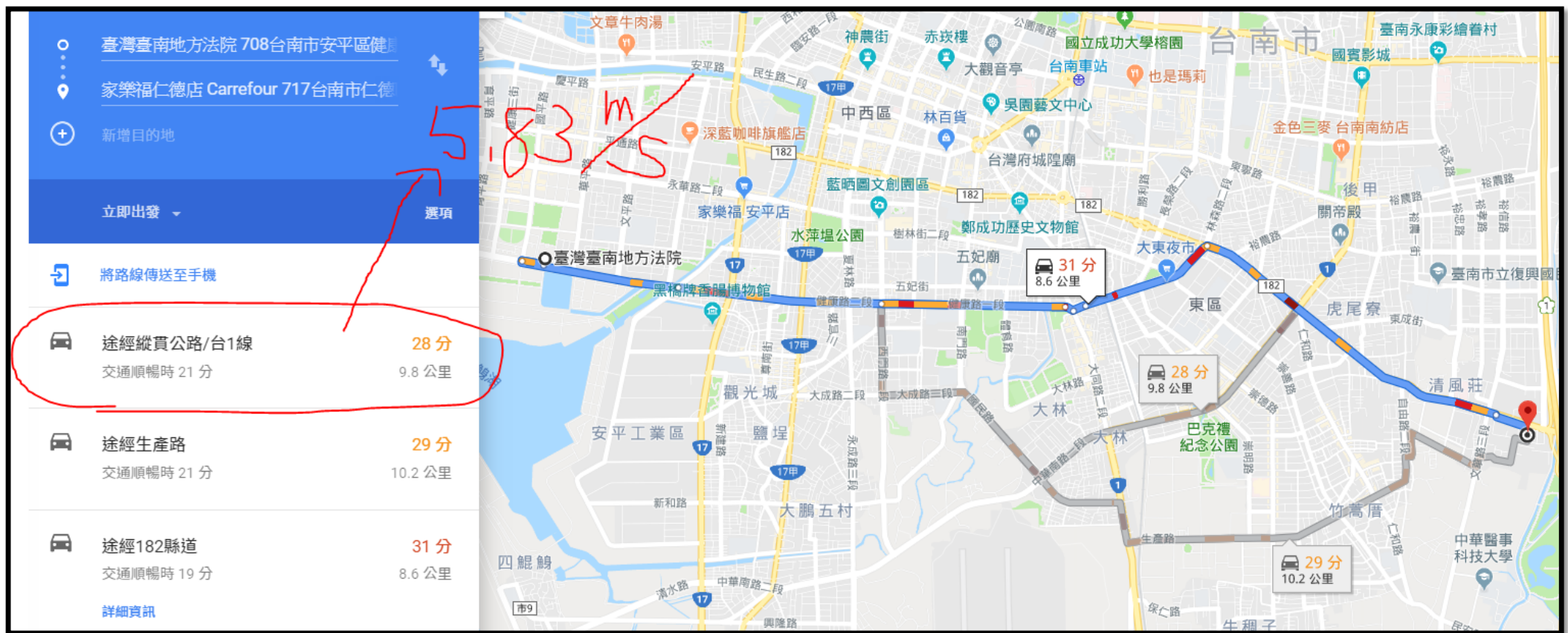
v3_TimeToSenderInfo:{

690=[-496249903#0, 2264.53, 1568.14],

630=[279049709#0, 3451.37, 1096.83],

600=[496493919#2, 1506.52, 1210.75]}

- 1.從仁德家樂福走到台南法院需要34分鐘10秒($V_{max}=5/s$)
- Distance_StartToSender3:8088.84 [m]
- $V_{real}=3.96$ m/s



- 2.從[台南法院]到[安平古堡]需要[10分鐘46秒]
- Distance_StartToSender3:3136.9 [m]
- $V_{max}=5/s$
- $V_{real}=[4.85] \text{ m/s}$



Fail case

	09:00-09:30	09:30	10:00
V2 (起點 仁德家樂福)			sender2
Case1:failed	At 09:20 , Got the request of sender4 with 09:30		
地址	東門圓環	Sender4 (德安百貨)	Sender2 (台南地方法院)



	09:00-09:30	09:30	10:00
地址	東門圓環	Sender4 (德安百貨)	Sender2 (台南地方法院)
	730s=12min10s 09:20+(12min)= 09:32 >09:30		Distance_S4ToS2: 5821 [m] TravelTime_S4ToS2: 1164 [s]= 19min24s

Success case

	09:00-09:30	09:30	10:00
V2 (起點 仁德家樂福)			sender2
Case2	At 09:10 , Got the request of sender4 with 09:30		
地址	好記牛肉湯	Sender4 (德安百貨)	Sender2 (台南地方法院)



	09:00-09:30	09:30	10:00
地址	好記牛肉湯	Sender4 (德安百貨)	Sender2 (台南地方法院)
	673[s]=11min13s 09:10 +(12min)<09:30		Distance_S4ToS2: 5821 [m] TravelTime_S4ToS2: 1164 [s]= 19min24s

At **09:10**, Got the request of sender4 with 09:30

	地址		到下一個sender地址[m]	預計到達下站時間
09:00-09:30 09:10	好記牛肉湯		3367	09:24
09:30	德安百貨	Sender4	5821	
10:00	台南地方法院	Sender2		
10:30				
11:00	安平古堡	Sender3		
11:30				
12:00				

At **09:20**, Got the request of sender5 with 09:30

	地址		到下一個sender的距離[m]	預計到達下站時間
09:00-09:30 09:20	好記牛肉湯		3367	09:24
09:30	德安百貨	Sender4	5821	
10:00	台南地方法院	Sender2	4593	如果10:10離開， 10:27
10:30	林百貨	Sender5	4936	如果10:40離開， 11:00:34到
11:00	安平古堡	Sender3		
11:30				
12:00				

At **09:20**, Got the request of sender5 with 09:30

	地址		到下一個sender的距離[m]	預計到達下站時間
09:00-09:30 09:20	好記牛肉湯		3367	09:24
09:30	德安百貨	Sender4	5821	
10:00	好記牛肉湯			
10:30				
11:00	安平古堡	Sender3		
11:30				
12:00				

At **10:30**, Got the request of **sender6** with **11:30**

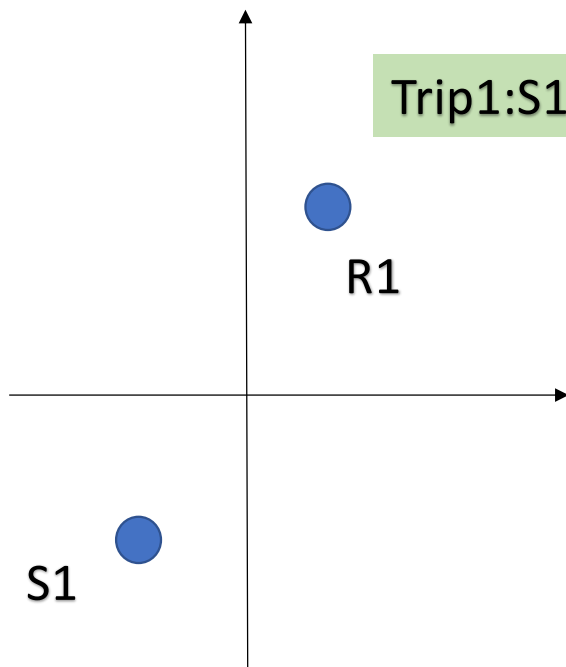
	地址		到下一個sender的距離[m]	預計到達下站時間
09:00-09:30 09:20	好記牛肉湯			
09:30	德安百貨	Sender4		
10:00	台南地方法院	Sender2		
10:30	林百貨	Sender5		
11:00	安平古堡	Sender3	7120 (估計旅行時間是 29min40s)	如果11:10離開， 11:39:40才會到成 大醫院
11:30	成大醫院	Sender6		
12:00				

Time Schedule

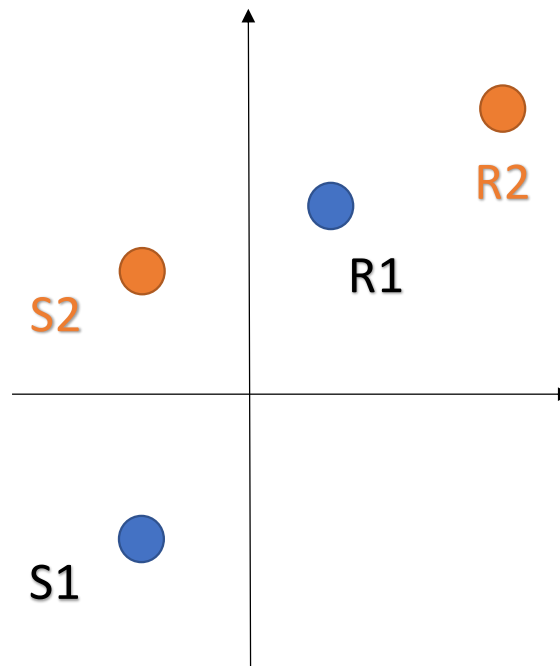
	地址		實際到達時間	從地址 離開時間	預期與現實的到達時間差距
09:00-09:30					
09:30	德安百貨	Sender4	09:17	09:30	提早13分鐘到
10:00	台南地方法院	Sender2	09:55	10:10	提早5分鐘到
10:30	林百貨	Sender5	10:27	10:40	提早3分鐘到
11:00	安平古堡	Sender3	11:01	11:10	晚到1分鐘
11:30	成大醫院	Sender6	11:21	11:40	提早9分鐘到
12:00					

Old method

1. High complexity of routing arrangement



Trip1:S1R1



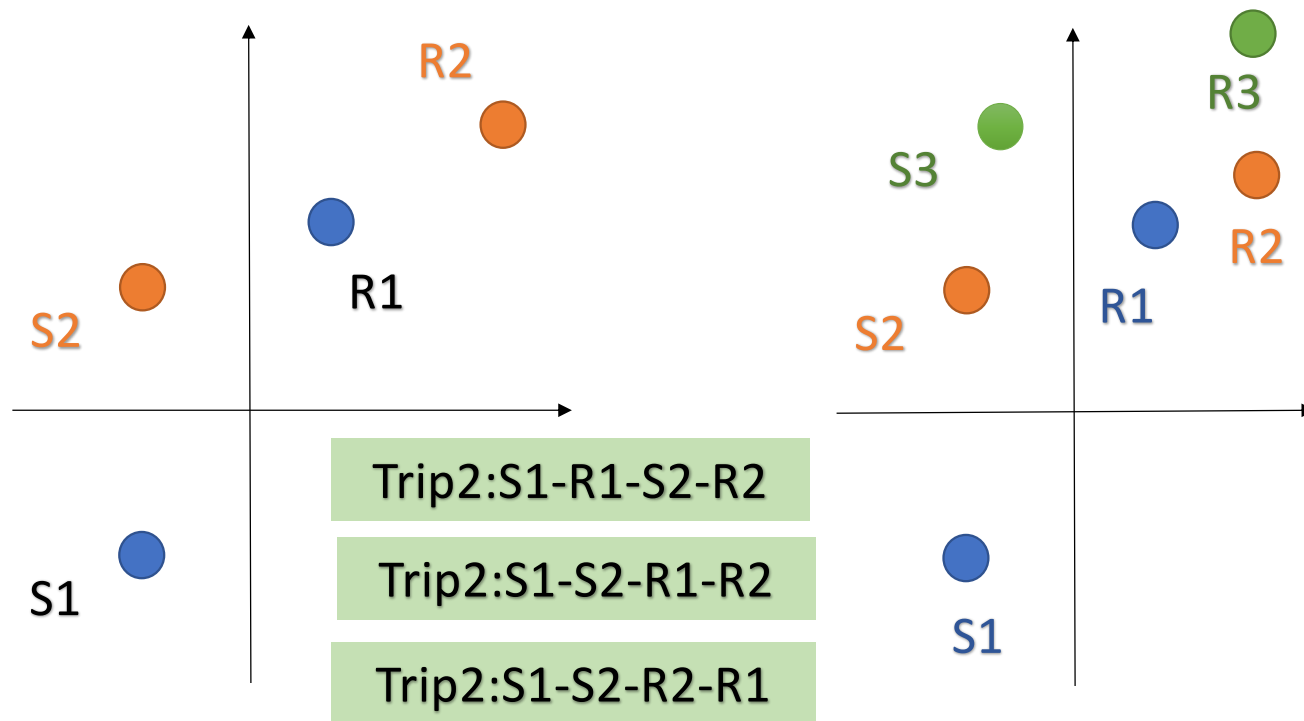
Trip2:S1R1S2R2

Trip2:S1S2R1R2

Trip2:S1S2R2R1

Old method

1. High complexity of routing arrangement
2. High uncertainty of the arrival time of receivers
3. More flexible chance to match the request



Trip3

S1-S2-S3-R1-R2-R3
S1-S2-S3-R1-R3-R2
S1-S2-S3-R2-R1-R3
S1-S2-S3-R2-R3-R1
S1-S2-S3-R2-R1-R3
S1-S2-S3-R2-R3-R1

S1-R1-S2-R2-S3-R3
S1-R1-S2-S3-R3-R2
S1-R1-S2-S3-R3-R2
S1-R1-S2-S3-R2-R3

S1-S2-R2-R1-S3-R3
S1-S2-R2-S3-R3-R1

Comparison of two methods

	v1	v2	v3	v4	v5
09:30				sender6	
10:00	sender1	sender2	sender10	sender10	sender8
10:30			sender4	sender7	
11:00		sender3			

Old method

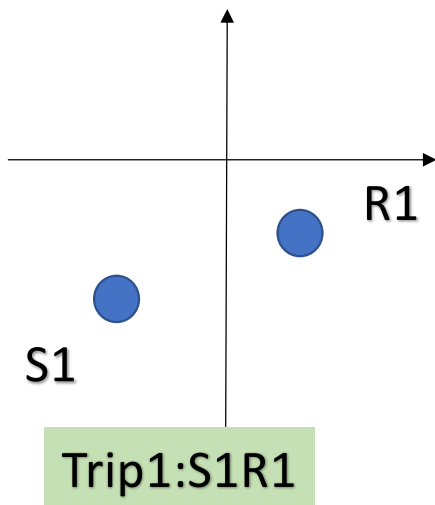
1. High complexity of routing arrangement
2. High uncertainty of the arrival time of receivers
3. More flexible chance to match the request

New method

- The gap between the real arrival time and expected time
- Receive the send-request and load containers **only** in the morning and deal with unloading containers only in the afternoon.
- Use a fix **time schedule** to decrease the computation of routing
- Add a Transshipment Center

When we **confirm** the expected arrival time of receivers?

- 1.when arrived to the sender address
- 2.when the cars arrived to a Transshipment Center
- 3.when the system got the send-order from Android



	v1	v2	v3	v4
09:30				sender6
10:00	sender1	sender2	sender10	sender10
10:30			sender4	sender7
11:00		sender3		

AV_Delivery_v1.0

貨品內容 請輸入貨品內容

貨品價值 NT

貨品重量 kg

貨櫃大小 L

收件人帳號 請輸入收件人帳號

貨車取貨地址 新北市永和區 安樂路248-2號

貨車目的地址 新北市板橋區

請輸入詳細地址(路名、段數、號數)

下一步 MAP_TEST

貨車目的地址

貨車取貨地點

貨車抵達時間選擇：

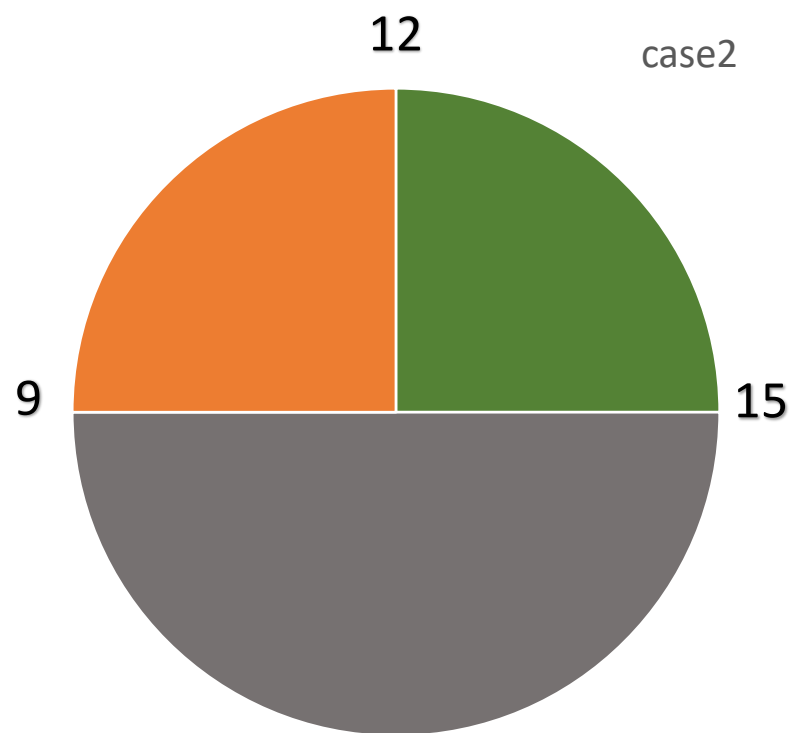
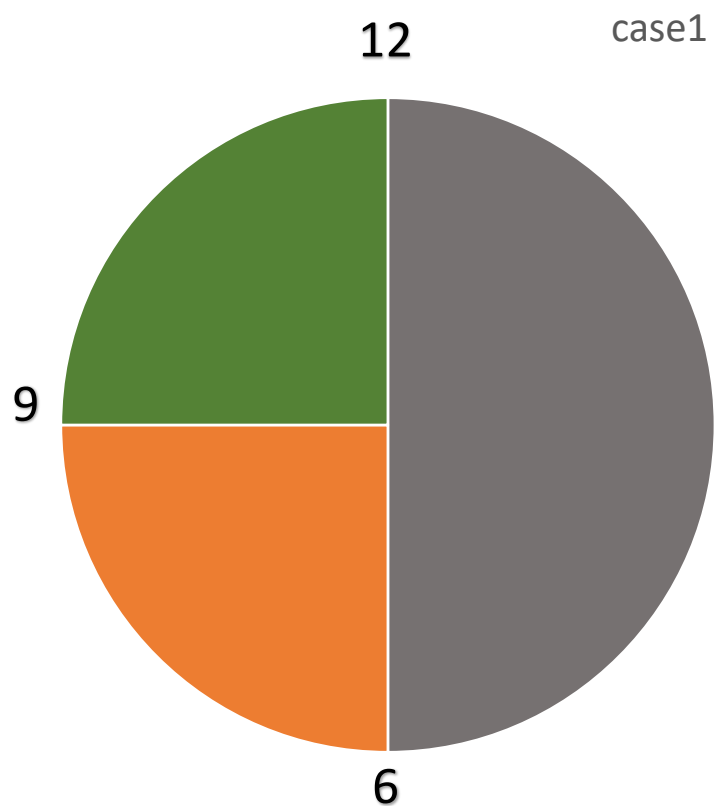
☐ 12:00 ~ 14:59

☐ 15:00 ~ 17:59

☒ 18:00 ~ 20:59

確認

收貨與送貨週期



1. 利用分段送貨收貨的週期安排，能簡化同一台車要處理"send","receive" request的複雜計算
2. 各時段區間能更專注在該區間的特定任務
3. 任務排程上會更嚴謹與固定
4. 多週期的好處是能夠擴增收送的時間區段

Receiver time schedule

	v5	v6	v7
13:00	r1	r2	r6
13:20			
13:40	r4	r5	
14:00	r3		
14:20			
14:40			

CarsMapWithSchedule:

{5=[780,820,840,860], 6=[780, 820],
7=[780]}

Next Step

- 1.stopDuration的動態調整
- 2.receiver time schedule
- 3.整合android 的”我要訂貨”