Municipality of Chatham-Kent

Interurban Busing Service Recommendations for Route D

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Agenda

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02 Problem

03 Data Collection

04 Model Formulation

05 Solution

06 Recommendations

07 Implications

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Overview

Overview

BACKGROUND INFO

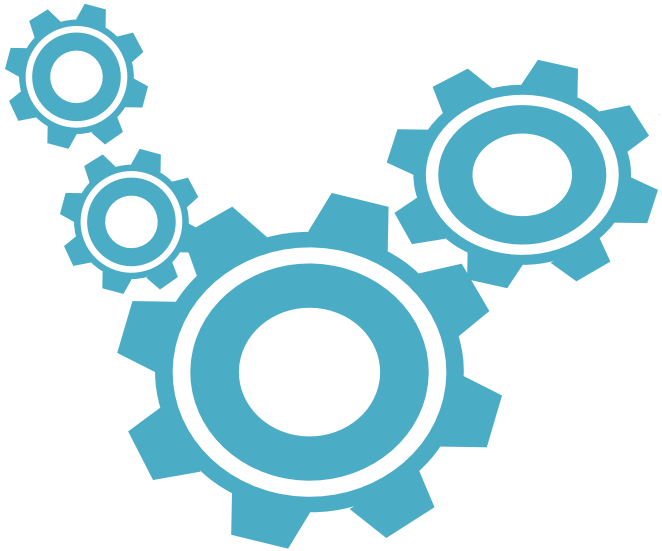
- Service commence on 2014
- 3 inter-urban routes and a seasonal route
- No service on Sundays & Holidays

CKtransit
Chatham Conventional

Problem

Problems

- Schedule adherence
- Low demand on a number of bus stops across different route
- Bus stop location




Data
Collection

Process of Data Collection & Analysis

Data that were used to build our model

Focus on ROUTE D

Run the MODEL

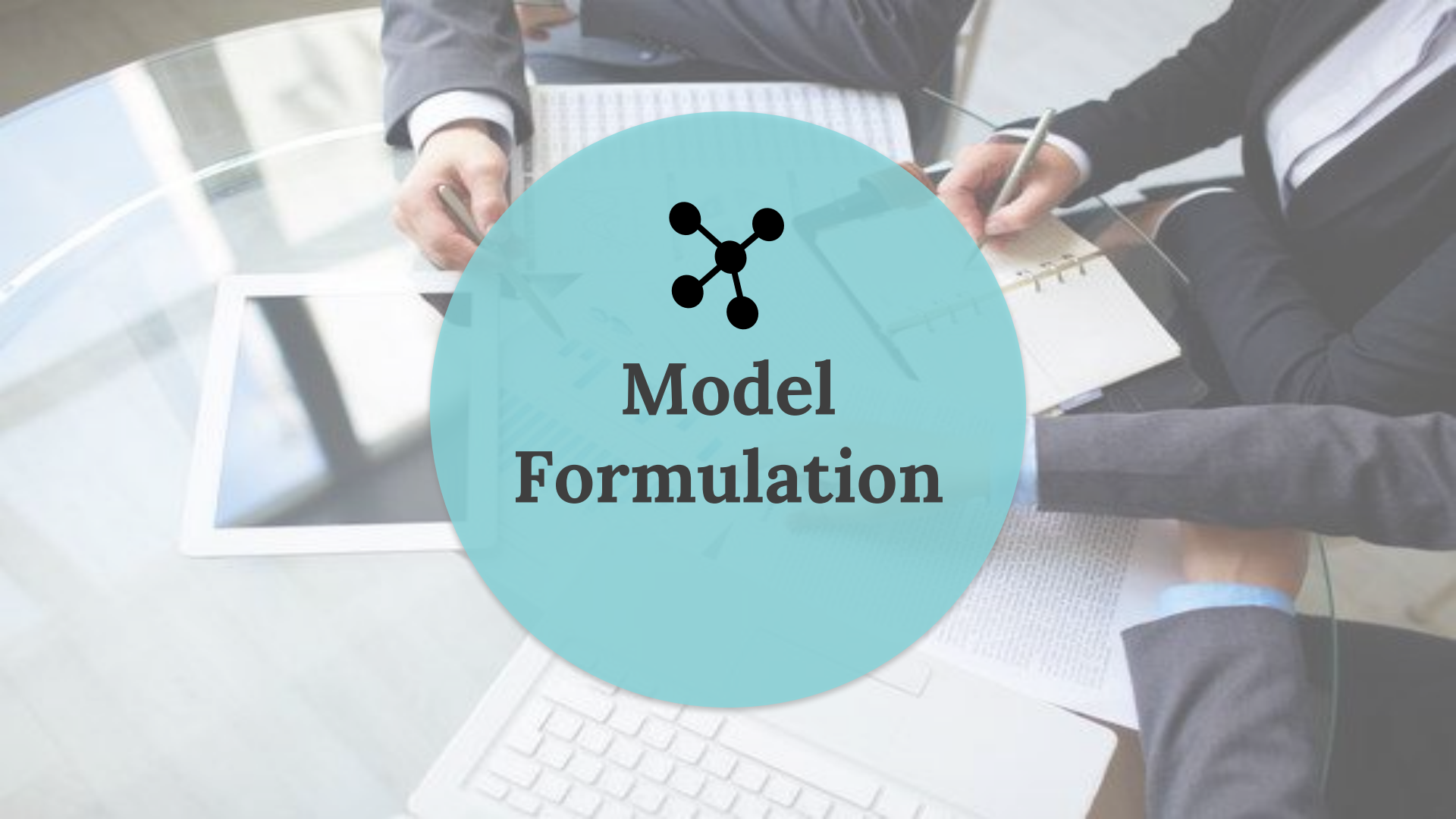
Insight from Given Data

- ➔ Boarding Reports
- ➔ Interurban Bus Route Map A / D / C

Coordinates of Route D Bus Stop

Driving Distance Using Google API

Traffic Report and Near Facilities Search


Model
Formulation

Our Model

Model formulation: Objective, Important Constraints

TYPE

Mixed - Integer Program

OBJECTIVE

- Minimize total travelling time of Route D
- Help address route adjustments and the placement of stops.

IMPORTANT CONSTRAINTS

That highly impact our solutions

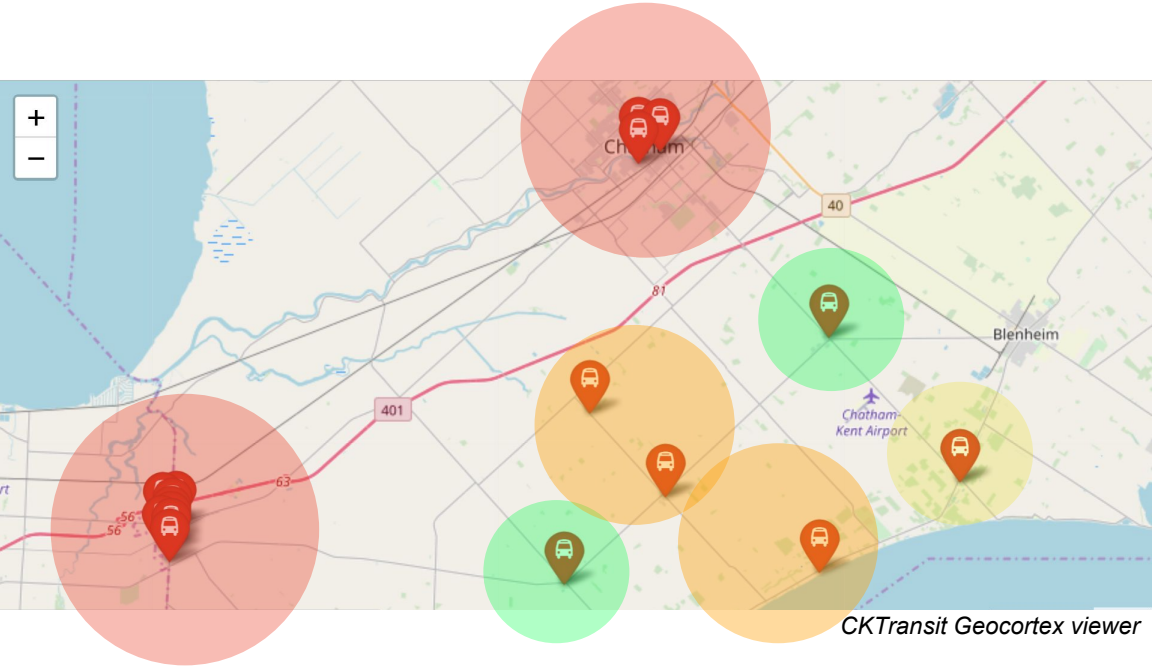
1) Each city should include at least one stop.

2) Bus stop spacing ≤ 12 minutes within the city

Average pedestrian speed : 1km / 12 min

Important Issue in First Constraint

'Each city should include at least one stop.'



CKTransit Geocortex viewer

Necessity to Keep **Minimum One Stop** in Each City

Urban Area: Chatham, Tilbury
Secondary Urban Area: Charing Cross, Merlin
Settlement Area: North & South Buxton, Dealtown
Hamlets: Cedar Springs


Solution

Solution from the Model

Which bus stops our model suggested us to reconsider?

Solution from the Model

Which bus stops our model suggested us to reconsider? Zoom to Tilbury

Remove 6 Red Stops in **Tilbury**

Homesteads Drive, Tilbury High School, Canal Street, Superior Street, Family Health Team, and Lyon Street

Green Route - Simple **Euclidean Distance** used, does not regard the possible driving path

This is because the route is drawn with Python codes
Slight errors expected in visualization but not in total travelling time


Recommendations

Final Recommendation with Route D

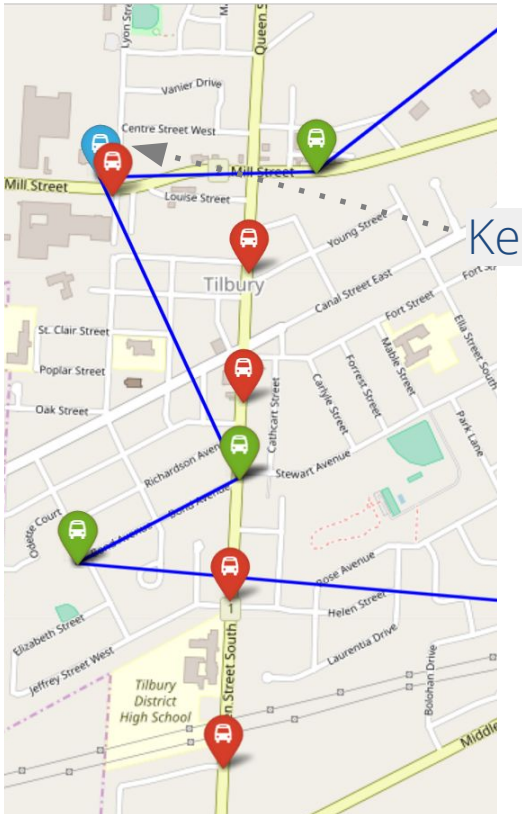
Model's suggestion + Our recommendation

Other Considerations

Relocation & Costs

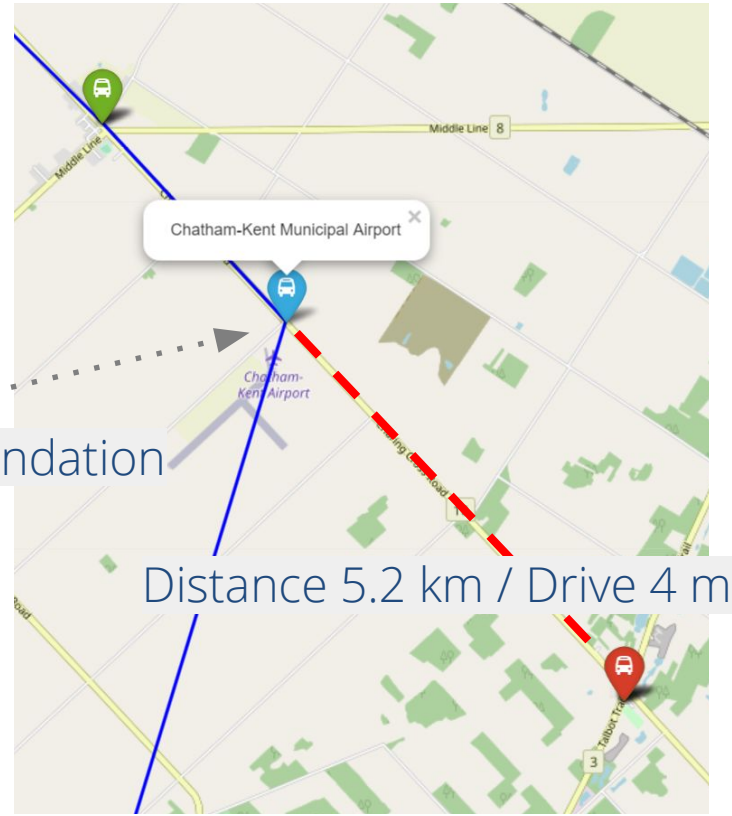
Final Recommendation with Route D

Model's suggestion + Our recommendation Zoomed



Keep **Family Health Team**

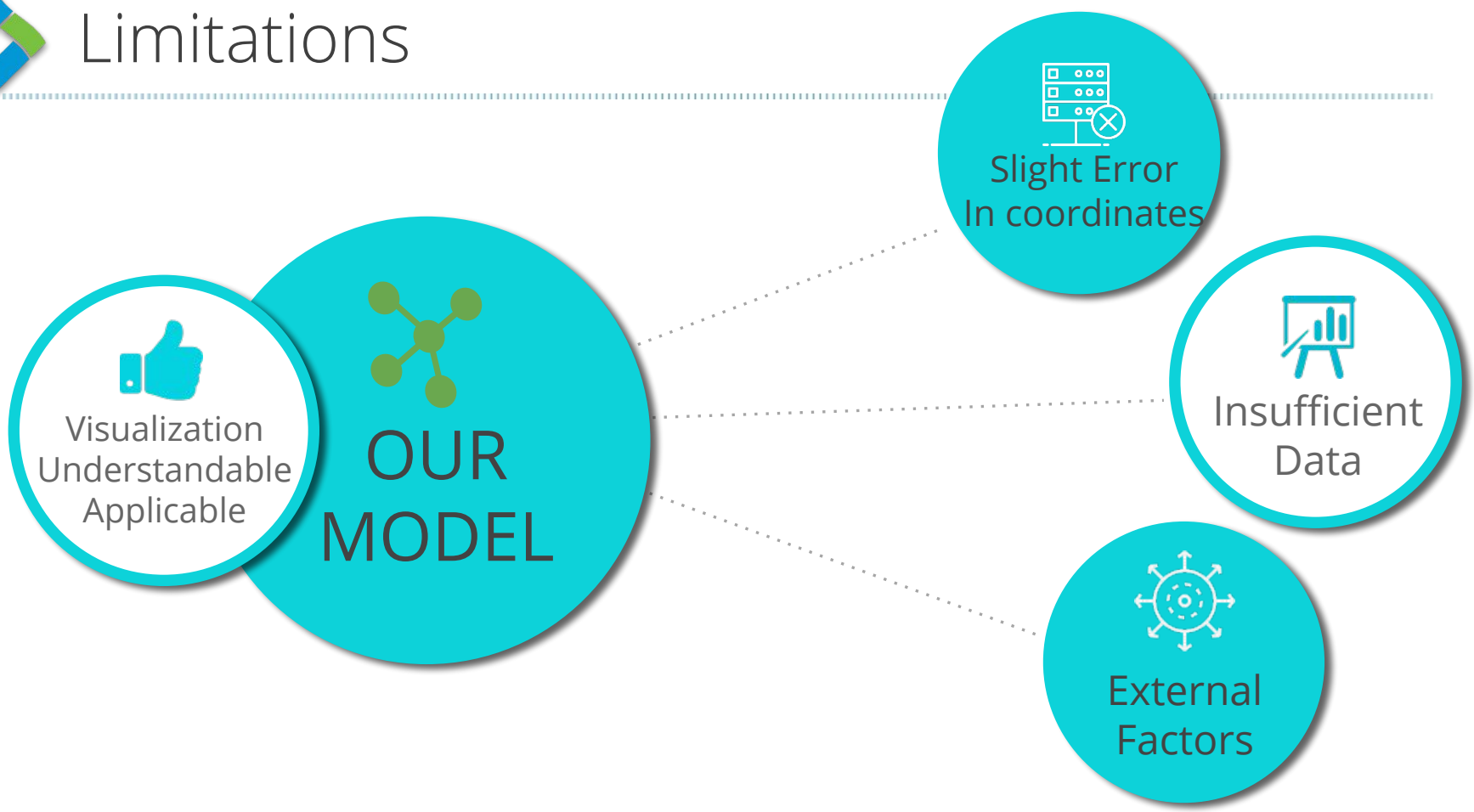
A new stop recommendation

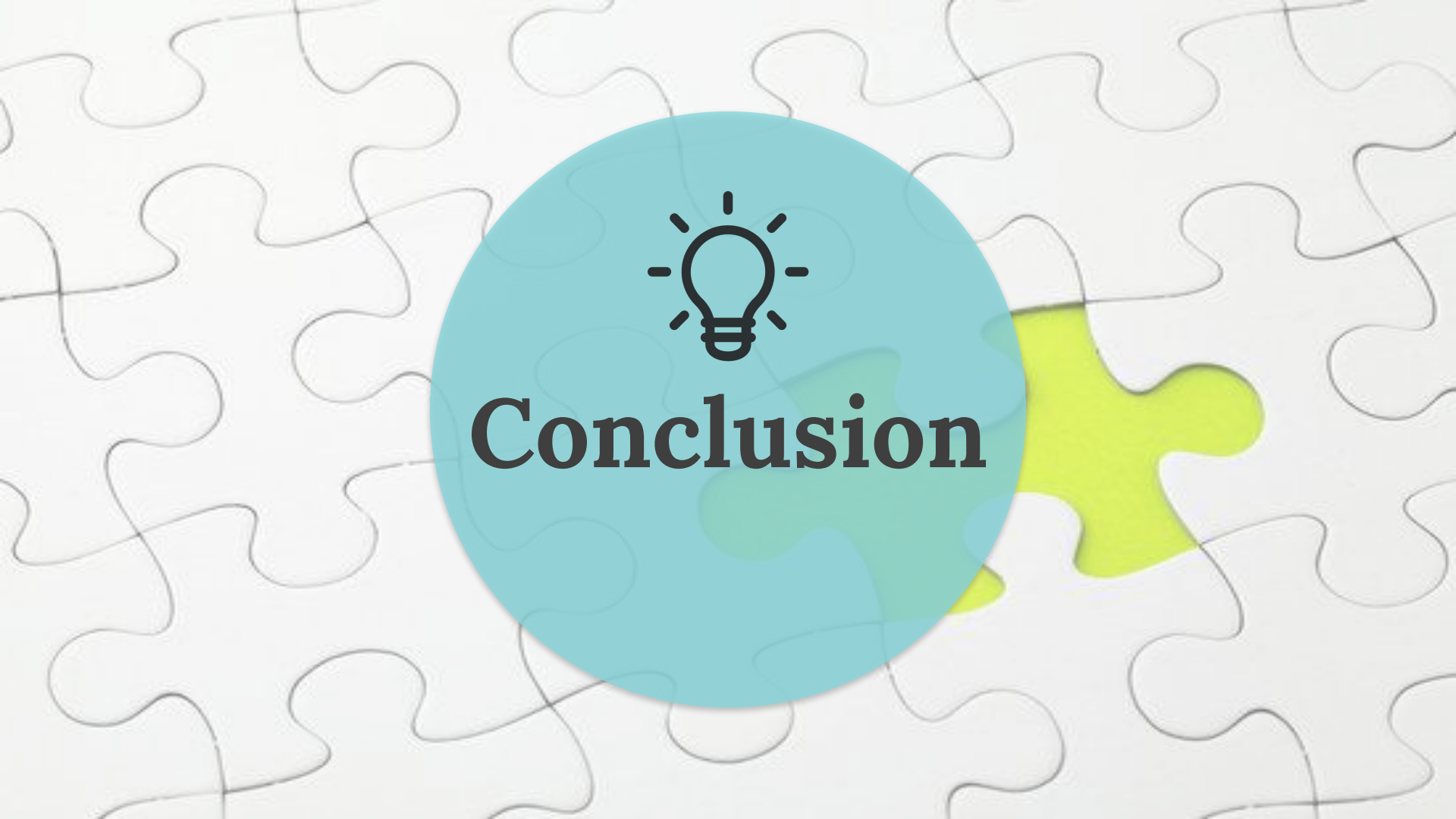


Distance 5.2 km / Drive 4 min

Limitations

Limitations




Conclusion

Conclusions

MODEL SOLUTIONS

<Total demand of new Route D>
6516 / year

<Total travelling time of revised Route D>
51.0 minute

<Selected bus stops to keep>
Homesteads Drive, Tilbury High School, Canal Street, Superior Street, Family Health Team, and Lyon Street

Questions


THANK
YOU