Bay Area Fare Coordination and Integration Study

Fare Structure Variants and
Business Case Evaluation Methodology

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METROPOLITAN TRANSPORTATION COMMISSION

Policy Advisory Council Subcommittee on Fare Coordination/Integration

May 10, 2021

Meeting Overview

Today's discussion is focused on the short list of six options to be considered in the FCIS as well as the Business Case process the project team will use to evaluate the modeling and analysis results.

TODAY'S AGENDA

1. Draft Fare Integration & Coordination Options – *We are seeking the Subcommittee's feedback before we finalize these for modeling*

2. Business Case Evaluation Methodology

Upcoming Project Milestones

- **May 17, 2021** – Fare Integration Task Force
- **May 24, 2021** – Project team presents to Blue Ribbon Transit Recovery Task Force
- **May 26, 2021 (3:30 pm) –** Policymaker Webinar (Brown Act meeting open to all)
- **May/June 2021** – Project team conducts detailed analysis of financial, ridership, and user impacts and develops implementation strategies
- **July 19, 2021** – Project team presents draft recommendations to the Fare Integration Task Force
- **July 2021** – Project team presents draft report and recommendations at transit agency governing board meetings
- **September 2021** – Fare Integration Task Force adopts final report

2. Fare Integration & Coordination Options

Key questions and issues for six shortlist fare policy options

Option and Variant Development Process Overview

An option is defined as a potential ‘high-level’ fare structure for the region that uses a combination of single and multiple trip pricing tools to integrate fares.

Short List of Fare Policy Options

- The shortlist includes two options per pathway that are relevant to the Bay Area regardless of future management models.
- Shortlist options have been renumbered to illustrate degree of change to fare rules and progression of options.

Discounts Only

1. Passes and caps
2. Discount Double Fares

Subregional Standardization

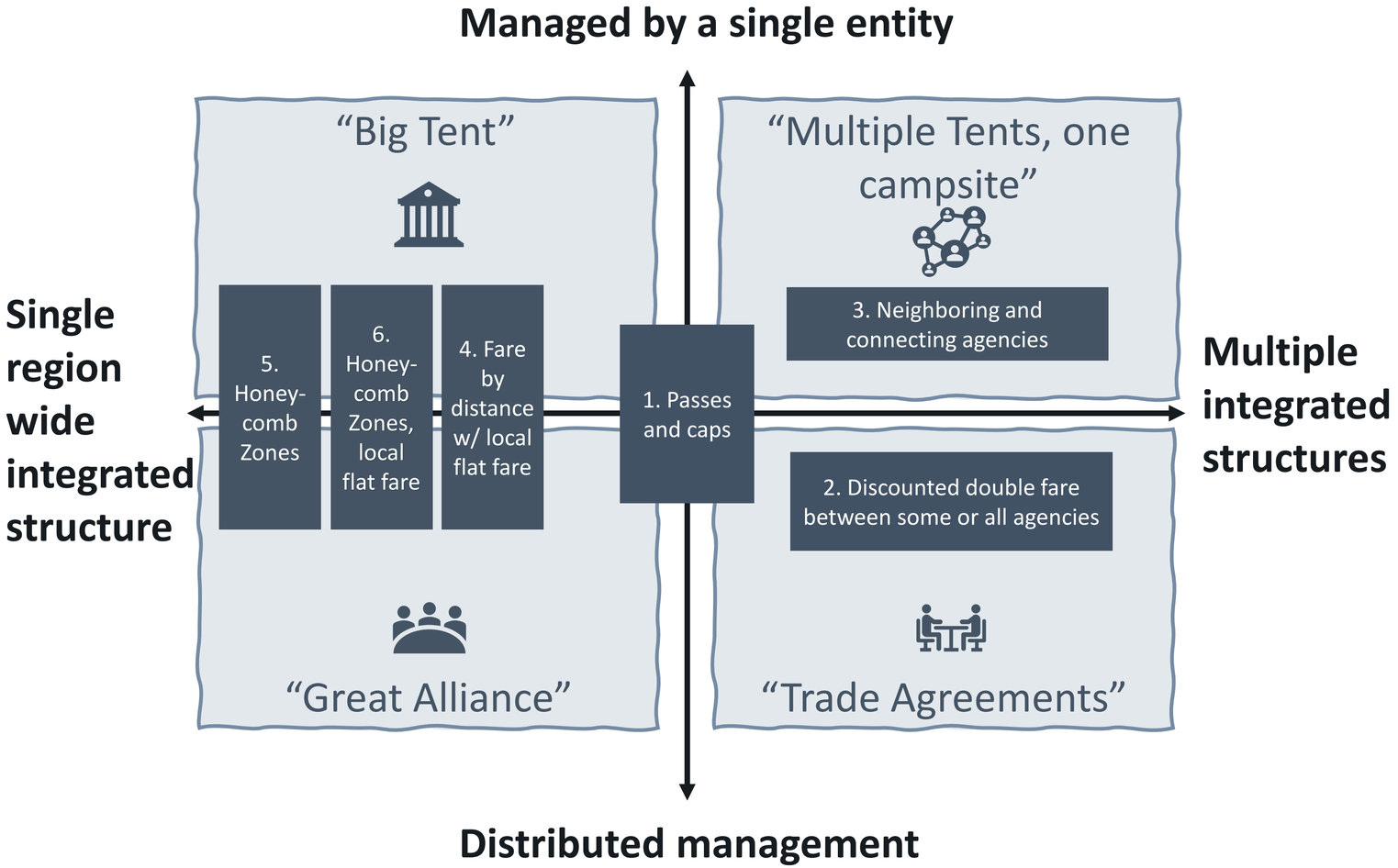
3. Neighboring and connecting agencies

Fare by Distance Option

4. Fare by distance with a local flat fare

Zonal Options

5. Honeycomb Zones
6. Honeycomb Zones with a local flat fare



Service Categories

Route Categories	Illustrative Examples (not comprehensive)	Fares Service Category
Intercity	Capitol Corridor, ACE, VTA Hwy 17 Express	Long-term integration opportunity
Regional	BART, WETA, Caltrain, GGT Basic (30, 70, 101), SamTrans 292, SolTransRed/Yellow Lines	**"Regional Fares"** in integrated fare structures
Commute/Express	CCCTA Express (90x series), GGT Commute, AC Transit Transbay, Dumbarton Express, WestCatLynx	
Rapid/Frequent	MUNI Metro, VTA Light Rail, AC Transit 1T, AC Transit 72R, MUNI 14/14R, SamTrans ECR, VTA Rapid lines (500s)	**"Local fares"** in integrated fare structures (example: these services would have a flat fare in local flat fare options)
Local	Most local services provided by small operators and community-focused service provided by larger operators	
Special	AC Transit 600 series, Marin Transit 100 series, Muir Wood Shuttle, MUNI 76x Headlands	
First/Last Mile	VTA ACE/Caltrain Shuttles, SamTrans Caltrain Shuttles, AC Transit 448	

Route Categories defined by "Planning and Operations Subcommittee" of Transit Operator Caucus of the Blue Ribbon Task Force

Option 1: Regional Passes and Caps

	Description	Examples	Cap/Accumulator
Multiple Agency Passes	Multiple agency passes that include specific agency pairs or neighbors.	Caltrain – SamTrans East Bay Operator Pass	Subject to a daily, weekly or monthly cap Analysis will include a review of travel behavior to determine the right caps based on (1) number of trips taken by traveler type, (2) combination of modes used, and (3) existing rules
Tiered Passes	Different tiers for local, regional service (by mode). Pay difference in price for trips outside tier.	Tier 1: Local service Tier 2: Regional service Tier 3: Local + Regional Service	
Single Regional Pass	Pay up front for universal pass, can be priced to encourage return to transit.	Local + regional service (Same as Tier 3 Pass)	
Employer/Institutional Pass	Institutional or government partners subsidize passes.	Caltrain Go Pass Program scaled up to region, to include BART	
Clipper START	Means based discount program for qualifying low-income transit riders.	Could add an accumulator, other changes to mitigate equity impacts	

Option 2: Discounted Double Fares

Option Definition

- Targeted discounts between agency pairs that meet **one or more** criteria
- Discounts can vary between agency pair

Assumptions to Test

- Reducing double fares will reduce barriers to transit travel without broader or more transformational changes

Variants

- A range of discounts for agency pairs to identify the optimal level of discount relative to the project evaluation criteria
- Examples:
  - 25% discount
  - 50% discount
  - 75% discount
  - 100% discount (free transfer)

Criteria for Selecting Agency Pairs:

- ❑ High levels of **joint agency ridership** pre-Covid
- ❑ Overlap of **high-quality transit service** (frequency, reliability, or speed)
- ❑ **Potential demand** defined by (auto mode share where high-quality service is present)
- ❑ Opportunity to **optimize trips** for customers currently using one operator

Option 3A: Neighboring and Connecting Agency Integration

Option Definition

- Targeted discounts between agencies within a defined ‘sub-region’
- All local agencies retain their existing fares, discounts are only applied when transferring
- Discounted or free transfers would be provided to all agencies within a sub-region
- There could be discounts for trips between sub-region

Assumptions to Test

1. Higher ridership can be realized by:
   - Providing targeted discounts between local agencies and regional agencies to allow transit to be used for ‘the whole trip’
   - Reducing double fares between neighbouring agencies
2. Fare integration will be more financially sustainable and more readily deliverable by retaining local agency fare setting authority
3. Varying transfer rules by agency pair will allow revenue and ridership to be co-optimized

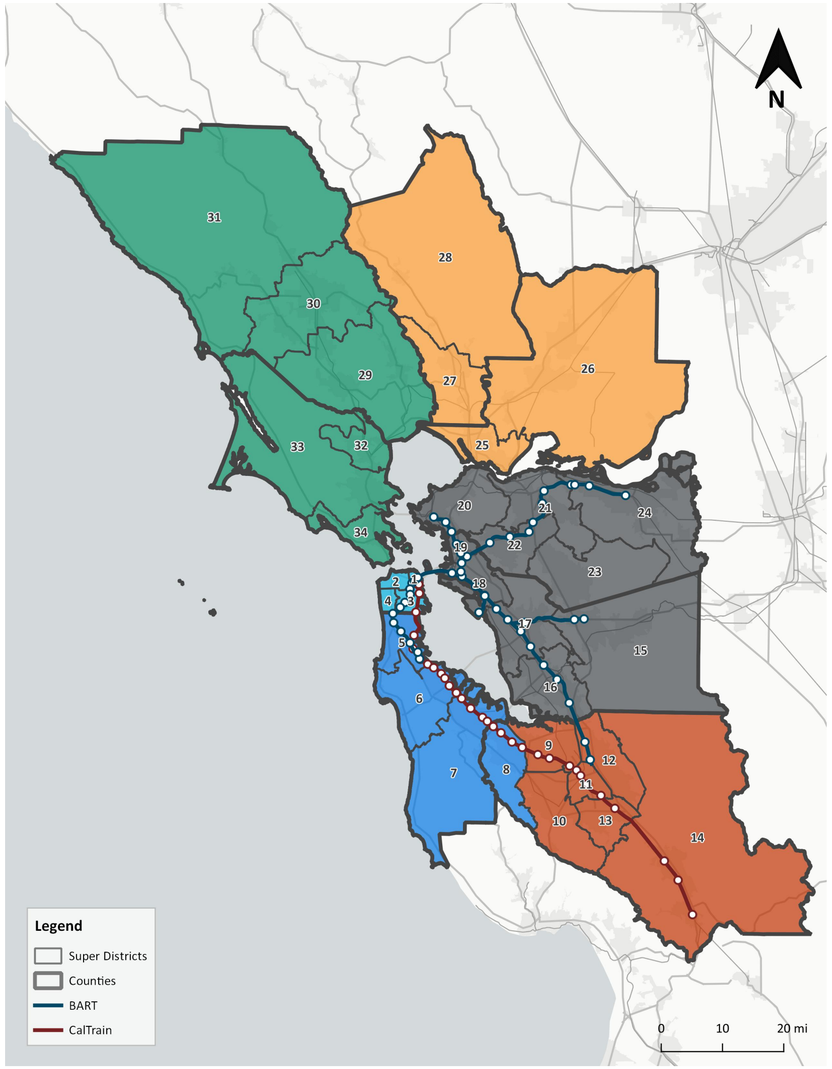
Variants

- A range of discounts for sub-regions to identify the optimal level of discount relative to the project evaluation criteria
- Examples:
- 25% discount
- 50% discount
- 75% discount
- 100% discount (free transfer)

How does this differ from Option 2?

- ❑ Allows flexibility for operators within subregions to agree on pricing arrangements more tailored to their localities
- ❑ Focuses on distinct areas of high-volume travel

Proposed Sub-Regions for 3A and 3B



How could sub-regions be defined?

Example:

- ❑ Based on travel demand between communities in the Bay Area
- ❑ Communities are bundled into sub-regions where 75-80% of all trips originating in a community have a destination in the sub-region

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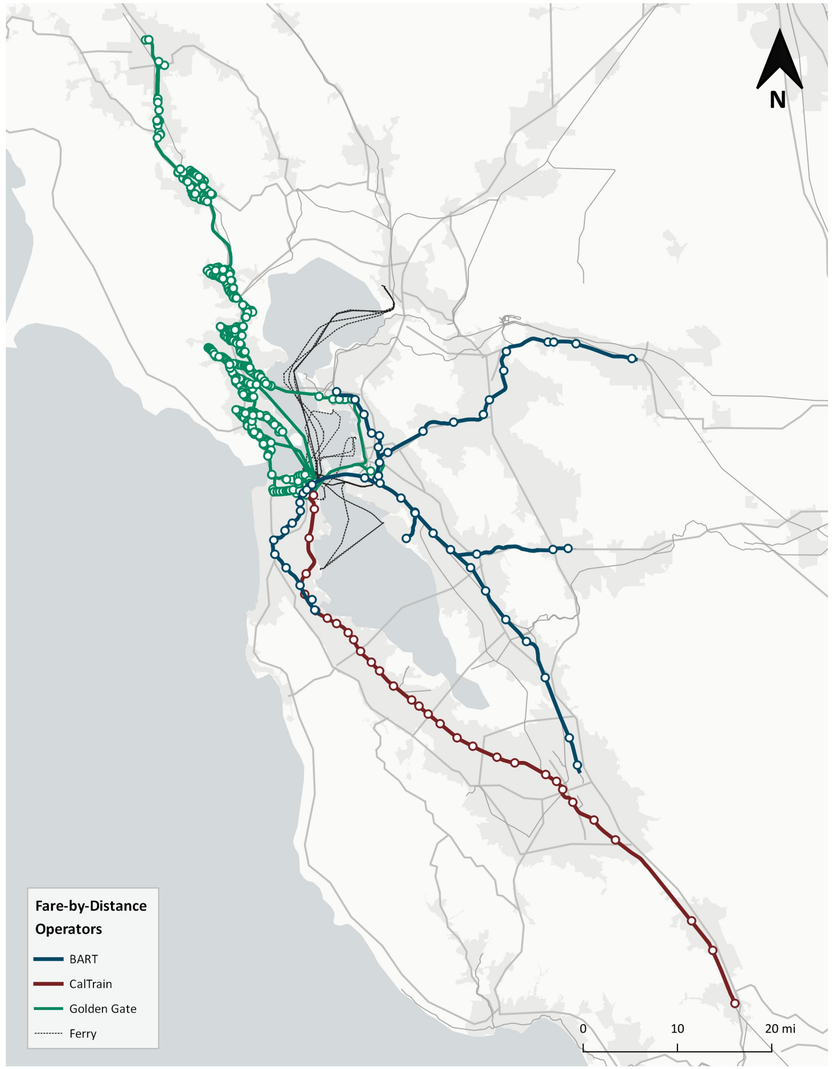
Fare by Distance Principles

Principles were developed in consultation with regional transit agencies – these principles will inform pricing during the next stage of work:

- ❑ Tactical/limited use of surcharges (for examples Transbay, Airport)
- ❑ Can generate similar revenue to today's structures
- ❑ Base fare will be aligned with local bus fares where possible
- ❑ Avoid disproportionate impact to low-income communities
- ❑ Remain flexible to future fare changes
- ❑ Use pricing to encourage efficient use of overall Bay Area transit system
- ❑ Make system more attractive to customers by applying one structure to all regional operators



Option 3B: Neighboring and Connecting Agency Integration with FBD

Option Definition

- Same sub-regions as option 3A
- All local agencies retain their existing fares, discounts are only applied when transferring
- Integrating all regional agencies into a single fare by distance fare curve; trips using multiple regional services will have a continuous fare based on total distance travelled on regional services without any transfer penalties

Assumptions to Test

1. Higher ridership can be realized by:
   - Integrating all regional services into a single fare structure
   - Providing targeted discounts between local agencies and regional agencies to allow transit to be used for 'the whole trip'
   - Reducing double fares between neighboring agencies
2. Fare integration will be more financially sustainable and more readily deliverable by retaining local agency fare setting authority
3. Varying transfer rules by agency pair will allow revenue and ridership to be co-optimized

Variants

- A range of fare by distance price curves for region, including:
  - A range of different base fare prices and distances (example: $3.00 for first 5 miles, $3.50 for first 10 miles)
  - A range of slopes (example: $0.30/mile) or step sizes (example: 5-10 miles costs $4.50, 10- 15 miles costs $5.50)
- A range of discounts for agency pairs to identify the optimal level of discount relative to the project evaluation criteria
- Examples:
  - 25% discount
  - 50% discount
  - 75% discount
  - 100% discount (free transfer)

Option 4: Fare by Distance with Local Flat Fare

Option Definition

- All local agencies have the same flat fare
- Transfers between local agencies are free
- Transfers between local and regional services are free
- All regional agencies use a single fare by distance structure
- Trips using multiple regional services will have a continuous fare based on total distance travelled on regional services without any transfer penalties

Assumptions to Test

1. Higher ridership can be realized by:
   - Integrating all regional services into a single fare structure
   - Removing all transfer penalties across the region
2. A single flat fare for local operators will make the system simpler and more equitable without additional financial or delivery impacts

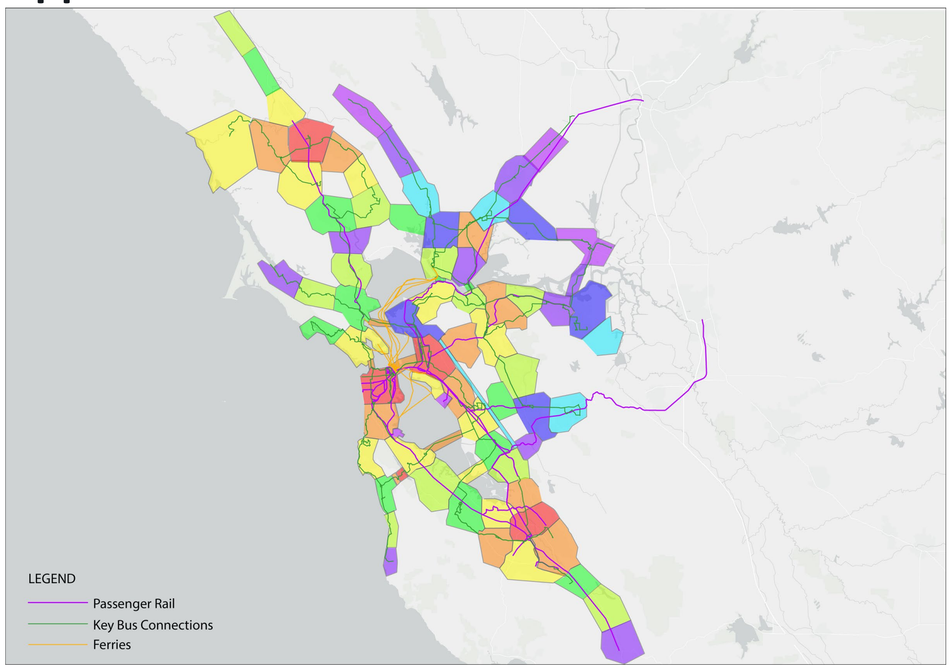
Variants

- A range of fare by distance price curves for region, including:
  - A range of different base fare prices and distances (example: $3.00 for first 5 miles, $3.50 for first 10 miles)
  - A range of slopes (example: $0.30/mile) or step sizes (example: 5-10 miles costs $4.50, 10- 15 miles costs $5.50)
  - A range of local flat fares (example: $2.00, $3.00, etc)

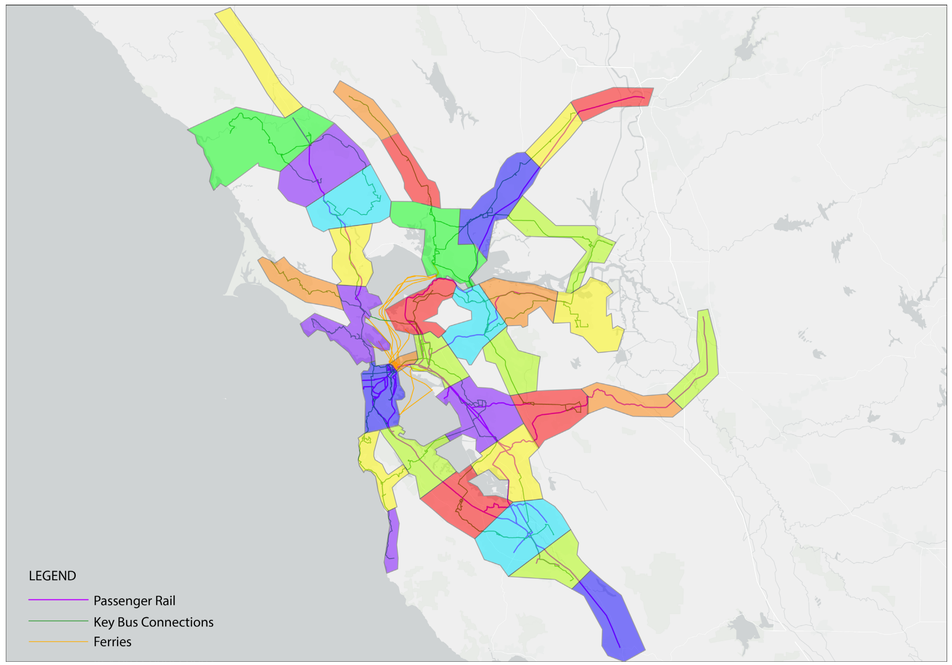
Final Zone Concepts for Testing

- ❑ Include option that raises similar amount of revenue to existing system/ addresses pricing steps for FBD operators
- ❑ Avoid arbitrary boundaries (price changes)
- ❑ Include some virtual zones for surcharges (Transbay, Airport)
- ❑ Avoid penalties to low-income communities
- ❑ Balance between zone size and price

Approach A – Small Zones



Approach B – Larger Zones



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Option 5: Honeycomb Zones for all services

Option Definition

•Integrating all agencies into a single zonal structure – all trips using the regional network are priced based on number of zones travelled

Assumptions to Test

1. Higher ridership can be realized by integrating all services into a single fare structure
2. A single fare structure will make the system simpler and more equitable
3. A zonal structure will be simpler and more intuitive to understand for most trips than the existing structure

Variants

- A range of prices per zone, including:
  - Uniform zone pricing (each zone costs the same)
  - Variable zone pricing (example: zone 1 costs $3.00, zone 2 adds $1.50, zone 3 adds $1.50, zone 4 adds $1.00, etc)
  - Free second zone (to minimize impact on short trips that cross a zone boundary)

Option 6: Honeycomb Zones with Local Flat Fare

Option Definition

- All local agencies have the same flat fare
- Transfers between local agencies are free
- Transfers between local and regional services are free
- Integrating all regional agencies into a single zonal structure – all trips using the regional network are priced based on number of zones travelled

Assumptions to Test

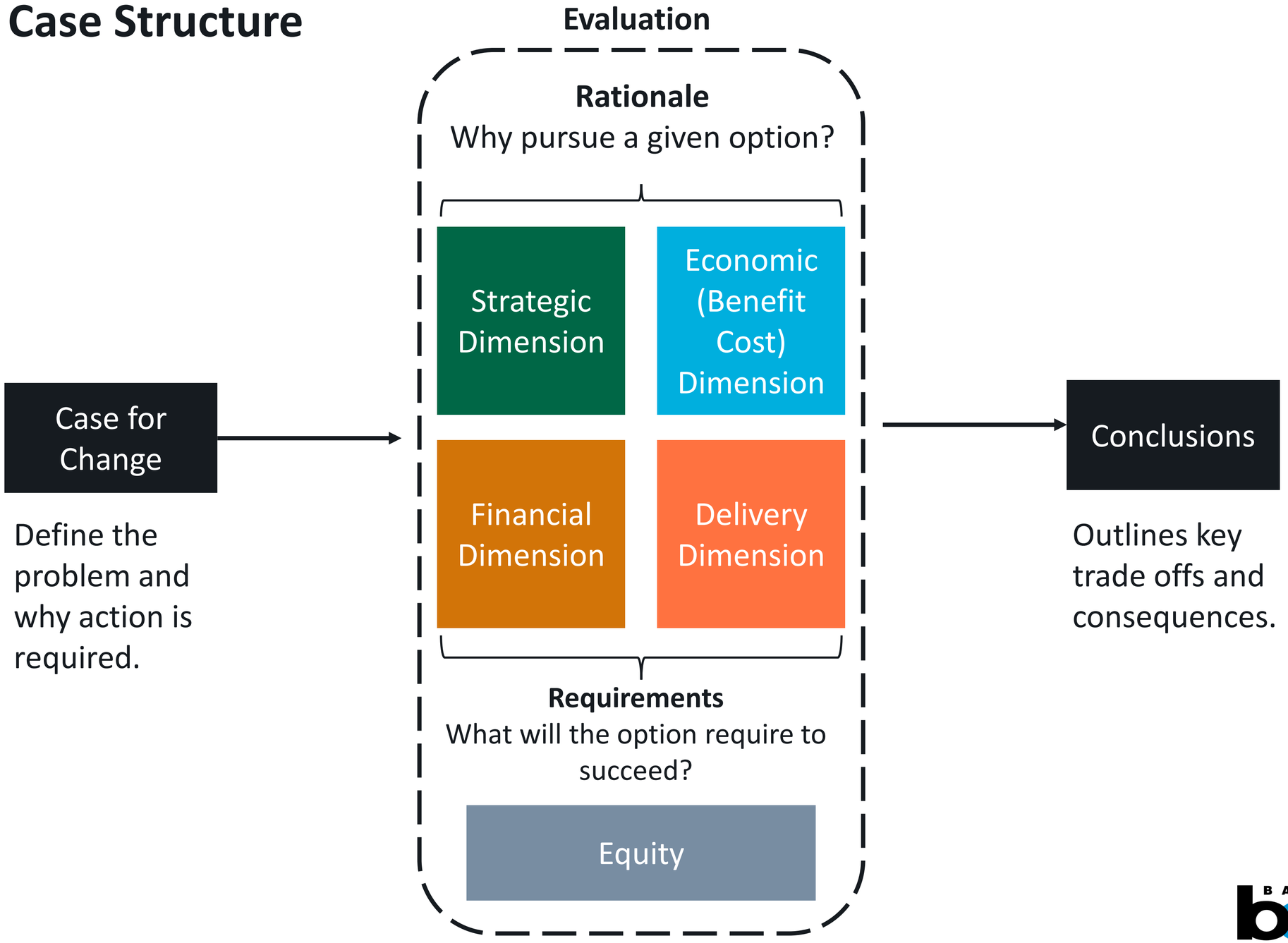
1. Higher ridership can be realized by:
    - Integrating all regional services into a single fare structure
    - Removing all transfer penalties across the region
2. A single flat fare for local operators will make the system simpler and more equitable
3. A zonal structure will be simpler and more intuitive to understand than fare by distance

Variants

- A range of prices per zone, including:
    - Uniform zone pricing (each zone costs the same)
    - Variable zone pricing (example: zone 1 costs $3.00, zone 2 adds $1.50, zone 3 adds $1.50, zone 4 adds $1.00, etc)
    - Free second zone (to minimize impact on short trips that cross a zone boundary)
- A range of local flat fares (example: $2.00, $3.00, etc)

3. Business Case Evaluation Methodology

Business Case Structure



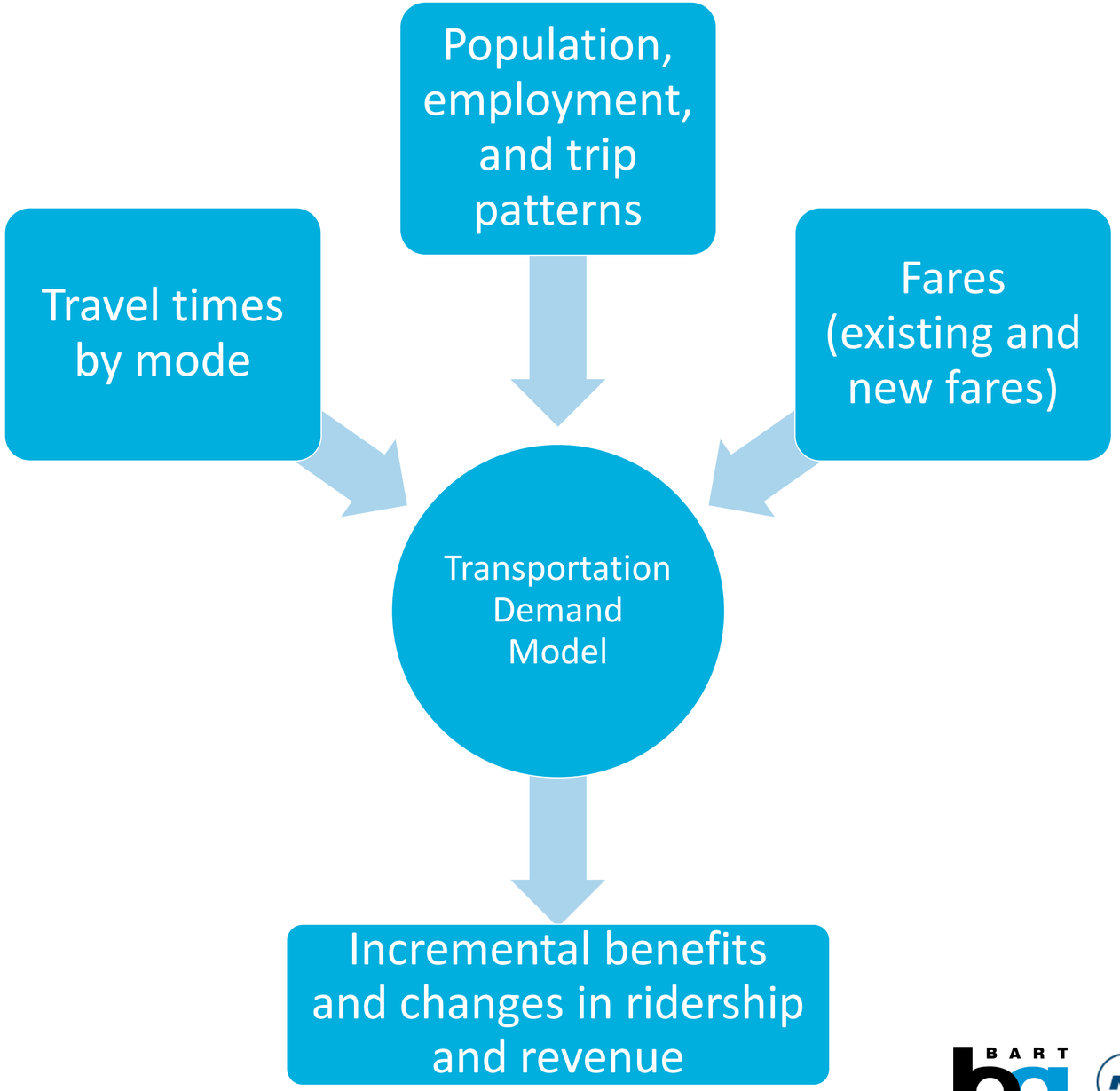
Role of Modelling in Business Case Analysis (1/3)

FCIS is a strategic study that aims to explore the potential benefits of fare integration in the Bay Area and if there is an optimal structure that:

- Offers benefits above and beyond the existing approach to fares
- Is feasible to deliver and operate

A transportation demand model will be used to assess the potential benefits of each fare policy or structure option on the short list.

MTC's travel model will be used to ensure consistency with other regional planning and project development exercises.



Strategic Dimension

Do each of the fare integration options support regional policies, goals, and objectives?

This evaluation will focus on:

- **A narrative that describes 'how' each option acts against the problem**
- **A qualitative/quantitative evaluation of the following themes:**

Theme	Benefit
	Core Benefits
A better transportation network	• Ridership • Improvements to Customer Experience • Fiscal sustainability • Equity
	Wider Benefits
Improved Quality of Life	• Accessibility and safety • Decongestion/VMT Reduction
Sustainable Environment	• Reduced Emissions
Regional Prosperity	• Connectivity between major activity and employment centres

Key Elements of Strategic Evaluation

- This is a focused and concise evaluation on 'what the region gets' from integration
- It connects fares to transit specific and wider regional goals and objectives
- It is used as a decision making tool to highlight the consequences of different choices
- Regional vs. local – need to explore both!

Strategic Dimension

Theme	Benefit	Metrics	Source
Core Benefits			
A better transportation network	**Ridership**	• Ridership change by market, traveller type, and time of day • By agency if possible	• Transportation demand model
	Improvements to Customer Experience	• User research informed metrics • Change in crowding on key transit services	• User research/discussions • Transportation demand model
	Fiscal sustainability and recovery	• Flexibility to realize to increase revenue for a given level of ridership	• Transportation demand model
	Equity	• User research informed metrics • Change in average fare across different income levels and geographies • % paying more, % paying less across different income levels and geographies • Change in travel time for a given level of fare by geography	• User research/equity discussions • Transportation demand model
Wider Benefits			
Improved Quality of Life	**Decongestion**	• VMT Change	• Transportation demand model
	Accessibility and safety	• Reduced collisions (based on VMT change) • Expanded access based on changes in fare	• Transportation demand model - VMT change x unit rate
Sustainable Environment	**Reduced Emissions**	• Change in GHGs and in air contaminants based on VMT change	• Transportation demand model - VMT change x unit rate
Regional Prosperity	**Connectivity between major activity and employment centres**	• Change in travel time for a given level of fare by geography • Catchment / travel time reductions for super commuters	• Transportation demand model

Economic Dimension

What is the value to society of each integration option?

This evaluation will focus on standard transportation economic appraisal:

- **User benefits**
  - Transit travel time savings and auto operating cost savings
  - Automobile travel time savings
- **External benefits**
  - Change in collisions
  - Change in walking/cycling
  - Change in emission
- **Costs**
  - New capital costs
  - New operating costs (for providing new service)

Key Elements of Economic Evaluation

- Illustrates the overall value of each fare structure
- Expressed in monetized terms
- Use it as a decision making tool to understand the overall value of the strategic benefits and compare them to the resources required to integrate

The economic evaluation is not concerned with 'who pays', so revenues are not factored into the benefit cost analysis.

Financial Dimension

What are the financial impacts of each fare integration option?

This evaluation will focus on standard financial analysis:

- Required capital costs
- Required operating costs
- Change to revenue
- Change to subsidy
- Financing strategy and high-level revenue sharing considerations
- Financial risks

Impacts will be presented regionally with engagement with transit agencies to explore local impacts.

Key Elements of Economic Evaluation

- Illustrates the short and long term cashflow impacts of the fare structures
- Expressed in financial terms
- Use it as a decision making tool to understand what level of finance and funding is required over the lifecycle of the structure

The financial evaluation is concerned with how the fare structure will be paid for and who will pay for it.

Implementation Dimension

What is required to successfully deliver and operate the fare structure?

This evaluation will focus on a high-level analysis of:

- Roles and responsibilities
  - Level of disruption during COVID // change management
- Key changes (capital, operating) required to deliver the fare structure
- Regulatory requirements
- Any required procurements or changes to capital → **can it be delivered with clipper 2.0?**
- Delivery risks

Key Elements of Economic Evaluation

- Illustrates the short and long term cashflow impacts of the fare structures
- Expressed in financial terms
- Use it as a decision making tool to understand what level of finance and funding is required over the lifecycle of the structure

The financial evaluation is concerned with how the fare structure will be paid for and who will pay for it.

Business Case Conclusion (Sample)

Strategic Case		IBC Performance	PDBC Alignment with IBC Operating Concept	PDBC Alignment with Refined Operating Concept	Rationale for Change
	Improved access to transit	389,000 trips per day	388,000 trips per day on the Ontario Line	374,000 trips per day on the Ontario Line	**Comparable performance** (Changes to input land use compared to IBC)
	Increased access to economic activity	+53,000 jobs accessible by transit +66,000 jobs accessible to lower-income Torontonians within 45 minutes by transit	+47,000 jobs accessible within 45 minutes by transit +57,000 jobs accessible to lower-income Torontonians within 45 minutes by transit		**Comparable performance** (Changes to input land use compared to IBC)
	Support a synergistic relationship between transit and city building	TOC could result in +20,000 new trips	Transit Oriented Communities could result in +55,000 new trips if delivered alongside the Ontario Line	Transit Oriented Communities could result in +52,000 new trips if delivered alongside the Ontario Line	**Improved performance** (Refined TOC forecasts and improved runtimes)
	Improved travel time and reliability	355 thousand minutes saved in peak hour	390 thousand minutes saved in peak hour		**Improved performance** (improved run times)
	Improved comfort and safety	Significant crowding reduction during the busiest hour of the day • Line 1: -14% crowding • Bloor-Yonge Station: -17% crowding • Eglinton Station: -15% crowding • Union Station: -13% crowding	Significant crowding reduction during the busiest hour of the day • Line 1: -6,000 trips (-15% crowding) • Bloor-Yonge Station: -14,000 trips (-22% crowding) • Eglinton Station: -5,000 trips (-16% crowding) • Union Station: -14,000 trips (-14% crowding)	Significant crowding reduction during the busiest hour of the day • Line 1: -5,000 trips (-12% crowding) • Bloor-Yonge Station: -10,000 trips (-15% crowding) • Eglinton Station: -5,000 trips(-16% crowding) • Union Station: -14,000 trips (-14% crowding)	**Comparable performance**
	A more resilient and integrated transport network	+39,000 transfers between Ontario Line and Rapid Transit and GO rail in peak hour	+62,000 new trips on transit per day +50,000 transfers between Ontario Line and the Frequent Rapid Transit Network	+60,000 new trips on transit per day +50,000 transfers between Ontario Line and the Frequent Rapid Transit Network	**Improved performance** (improved run times)
	Moving people with less energy and reduced emissions	-1 million tonnes of GHG emissions per year	- 7.2 million litres of automobile fuel saved per year -14,000 tonnes of GHG emissions per year		Since the publication of the IBC, the GHG estimate in the published IBC was iden-tified to be erroneous and has since been corrected and updated.
	Improve Quality of life and public health	Note – indicator refined for PDBC to focus on health impacts not captured in IBC	-28,000 car trips a day resulting in -1,200 collisions causing death or injury over the project lifecycle		Current version of benefit not included in IBC
	Unlocking jobs and economic development	New benefit in PDBC	+4,700 jobs per year supported in construction and supply train industries between 2020-2030		New benefit not included in the IBC

Economic Case	IBC Performance (million 2019$)	PDBC Alignment with IBC Operating Concept (million 2020$)	PDBC Alignment with Refined Operating Concept (million 2020$)	Rationale for Change
Total Economic Benefits (million $)	$9,200	$10,230 to $11,310	$9,900 to $10,960	**Improved performance** Optimized run times, interchanges, and consideration of additional user benefits
Total Costs (million $)	$10,400 to $12,000	$9,910 to $10,550	$9,610 to $10,260	**Improved performance** Detailed design that allows greater certainty on costs and risks
Expected NPV (million $)	-$2,800 to -$1,200	$540	$500	**Improved performance** Improved benefits with costs that have decreased relative to IBC high-end estimates.
Expected BCR	0.76 to 0.88	1.05	1.05	

Financial Case	IBC Performance	PDBC Alignment with IBC Operating Concept	PDBC Alignment with Refined Operating Concept	Rationale for Change
Capital Costs (million $)	$9,500 to $11,400 [3]	$8,600	$8,420	**Improved performance and change in assumptions** Detailed design that allows greater certainty on costs and risks. Terminal value of land was not included in the IBC
Operations Costs (million $)	$1,900	$1,570	$1,410	**Improved performance** Improved 'bottom up' operating cost model
Revenue Impact (million $)	$1,800	$ 2,430	$ 2,360	**Change in assumptions** Fares no longer have a discounted double fare
Net Financial Impact (million $)	-$9,600 to $11,500	-$7,740	-$7,470	**Improved performance** Refined costing has resulted in a net financial impact lower than the IBC
Revenue Operating Cost Ratio	0.95	1.6	1.7	**Improved performance** Increases in revenue and decreases in operating costs relative to IBC

Deliverability and Operations Case	IBC Performance	PDBC Alignment with IBC Operating Concept	PDBC Alignment with Refined Operating Concept	Rationale for Change
Procurement Approach	IBC reviewed a range of P3 delivery models.	Metrolinx and Infrastructure Ontario will use a multipackage P3 model to deliver the Ontario Line while mitigating key risks and maximizing value for money and operational flexibility.		Metrolinx and Infrastructure Ontario developed a procurement model based on market sounding and further technical analysis and planning.

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Fare Structure Business Case Summary Findings (Example)

	Strategic Case – does the concept realize the transformative vision?	Economic Case – what is the value to society of pursuing the concept?	Financial Case – what is the concept's preliminary financial impact?	Deliverability and Operations Case – can the concept be implemented/ operated?
Concept 1 Modified status quo	• Low alignment with transformative vision – due to limited flexibility to set fares to meet market and customer needs • Consider key lessons in the development of implementation plan	Strong economic performance – NPV of $1.8 to $3.7 billion 2015 dollars	• Revenue Neutral Financial Impact:-$150 million • Revenue Investment Financial Impact: -$2.7 billion	• Low deliverability risk due to minor changes
Concept 1b Modified status quo with FBD	• Low alignment with transformative vision – more flexible than Concept 1 due to use of FBD, but overall it is a more complex structure • The concept is unlikely to be an effective transformational or incremental structure	Moderate economic performance – NPV of $0.5 to $2.5 billion 2015 dollars	• Revenue Neutral Financial Impact:-$320 million • Revenue Investment Financial Impact: -$2.8 billion	• Moderate risk due to uncertainty for local-RT trips • If a software solution cannot be developed, costs could increase significantly
Concept 2 Zones	• Moderate alignment with transformative vision; however the concept has limited potential to evolve over time due to the complexity of modifying zones. • The concept is unlikely to be an effective transformational or incremental structure	Strong economic performance – NPV of $1.1 to $2.7 billion 2015 dollars	• Revenue Neutral Financial Impact:-$60 million • Revenue Investment Financial Impact: -$2.6 billion	• Contingent on governance reform and establishing zones – high risk
Concept 3 Hybrid	• Moderate alignment with transformative vision – due to the creation of a more seamless and user friendly structure • Consider key lessons in the development of implementation plan	Strongest economic performance – NPV of $2.2 to $3.4 billion 2015 dollars	• Revenue Neutral Financial Impact:-$150 million • Revenue Investment Financial Impact: -$2.7 billion	• Moderate risk due to uncertainty for local-RT trips • If a software solution cannot be developed, costs could increase significantly
Concept 4 FBD	• Strongest alignment with vision – due to provision of a seamless region wide fare structure that is flexible enough to adapt fares to meet most customer and market needs • Consider in the development of transformational structure	Strongest economic performance – NPV of $1.4 to $2.4 billion 2015 dollars	• Revenue Neutral Financial Impact:-$140 million • Revenue Investment Financial Impact: -$3.0 billion	• Moderate-high risk due to implementation of FBD on local and RT due to large shift in software, infrastructure, and operations

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Discussion


#291 8:04PM 5 MIN LAT
#193 8:35PM ON TIME
119
LOOK UP
WAIT BEHIND YELLOW LINE