



KANE COUNTY
RANDALL/ORCHARD ROAD CORRIDOR
BUS RAPID TRANSIT FEASIBILITY STUDY

Randall/Orchard Road Corridor Bus Rapid Transit Feasibility Study Executive Summary

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EXECUTIVE SUMMARY

INTRODUCTION

Kane County embarked on this study to assess the future viability of implementing Bus Rapid Transit (BRT) in the Randall/Orchard Road Corridor. The corridor has traditionally served automobile travel and there currently is only limited transit service in the corridor.

Kane County envisions using BRT as a mechanism for transforming this auto-dominated commercial corridor to one that is pedestrian-friendly and multi-modal, while promoting economic development and realizing benefits such as environmental and public health improvements. The envisioned BRT service would be part of a regional rapid transit network including BRT service on I-90 between IL 72 and Schaumburg.

Incremental or phased implementation of BRT in the corridor, along with transit-supportive land use and development, is among several options for reducing vehicle travel demand that have been recommended by past long-range plans in Kane County. One motivation is the projected severe traffic congestion that would remain by 2040 even after nearly \$3 billion of arterial roadway projects, far in excess of available funding.¹ Around the U.S., jurisdictions are recognizing the need to adapt transportation corridors for a

broader conception of local and regional mobility and are pursuing transit system development as a key element of such efforts.

This study is not an exercise in planning, engineering, or design for a specific BRT project, but rather a “what-if” examination of changes that would be needed in the corridor to support BRT and the potential benefits that could be expected from incorporating this mode of transit along Randall and Orchard Roads. This summary of the study provides a brief overview of BRT followed by an assessment of:

- Compatibility of the corridor with BRT, given current conditions along it
- Future conditions needed to successfully accommodate BRT along the corridor in the 2040 timeframe
- Potential benefits attainable from investing in an enhanced transit system and fostering supportive land uses along the corridor, based on conceptual BRT service and station area development. Benefits evaluated include reduced travel delay and monetary cost savings; reduced energy usage and environmental impacts; improved public health outcomes; reduced land use footprint and impacts; and economic development.

¹ Kane County 2040 Transportation Plan

BRT OVERVIEW

Bus Rapid Transit is a high-quality transit service that is differentiated from traditional fixed-route bus service by a unique identity and enhanced transit travel speed, reliability, and passenger comfort.

BRT systems employ a broad spectrum of strategies, based on available resources, corridor constraints and benefits desired:

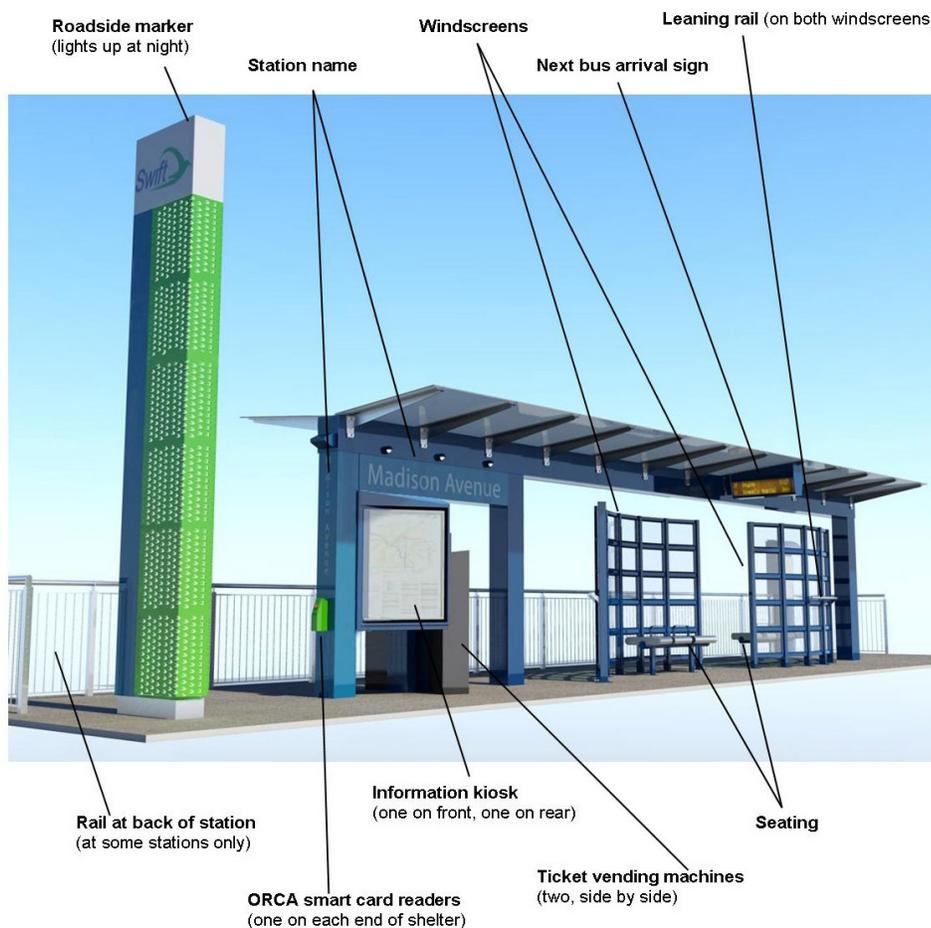
- **Dedicated running ways and/or transit signal priority (TSP).** Investments in transit speed and reliability ensure that BRT travel times are competitive with automobile travel. Exclusive transit lanes and queue jumps are examples of priority running ways that allow BRT to bypass congested roadways and intersections.
- **Enhanced stations.** BRT stations and amenities (see diagram below) ensure customer comfort and convenience and facilitate quick passenger loading and unloading. Enhanced pedestrian and bicycle infrastructure in station areas enables transit connections between stations and destinations located off of the BRT corridor.
- **Specialized vehicles.** Unique buses provide a rail-like level of customer amenities and high passenger-carrying capacity.



BRT vehicles are coordinated with station branding. Stations are well-lit and offer off-board fare collection and other amenities.

Source: Flickr, Oran Viriyincy

- **High quality service.** BRT service offers long hours, high frequency, and convenient connections to destinations off of the BRT corridor.
- **Enhanced fare collection systems.** Streamlined fare collection reduces passenger boarding times and therefore limits delays at stops.
- **Differentiated branding.** Unique designs and promotion distinguish all BRT elements (vehicles, stations, signage, etc.) from local bus service and highlight it as a high-quality service.



Station amenities are designed to create a strong brand identity for BRT and maximize passenger comfort/convenience.

Note: ORCA is a universal transit fare payment smart card in the Seattle region.

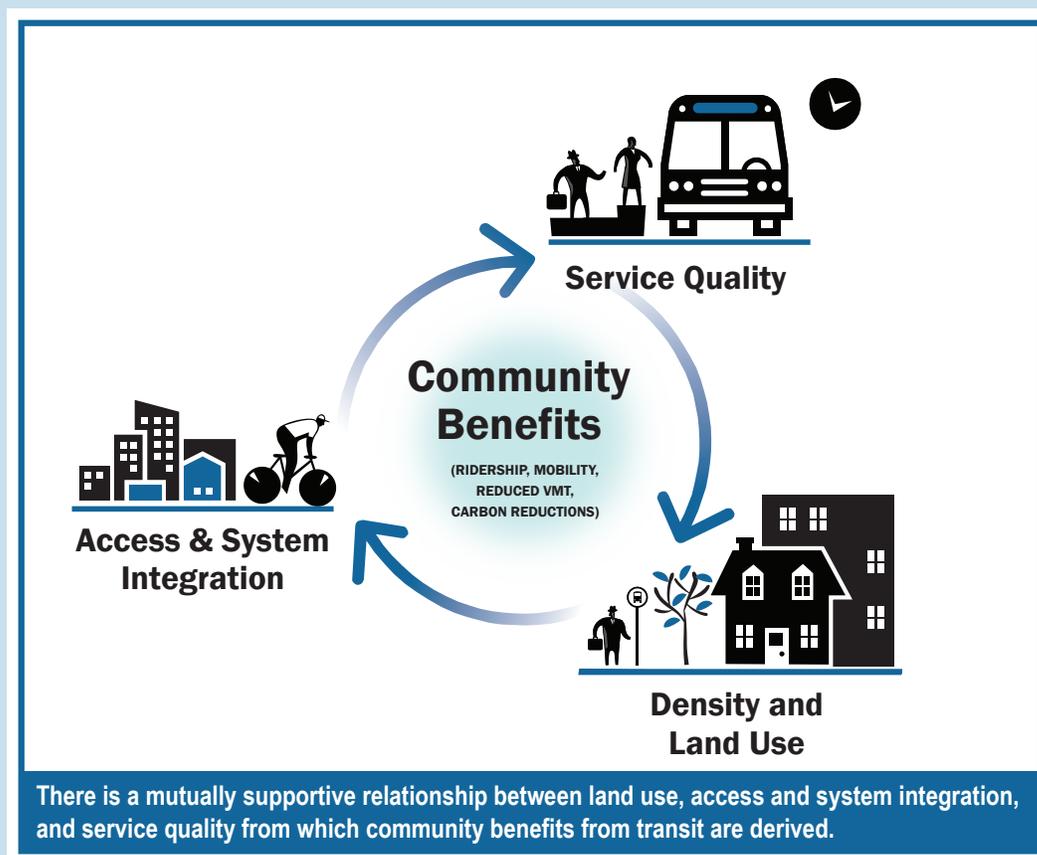
Source: Community Transit

The BRT Primer (Appendix C of the Final Report) provides a detailed discussion of BRT characteristics.

Conditions for Successful BRT Service

Transit-supportive land uses focused within an up to half-mile radius around a station area—the distance potential riders will typically walk for high-quality transit service—is the most critical condition for successful BRT service.

- **Transit-Land Use Connection.** There is a mutually-supportive relationship between land use, transit service quality, and transit accessibility, as illustrated in the diagram below. Density is the primary factor in transit ridership. Increases in residential and employment density, with a diversity of land uses and housing types, expand BRT's ridership base and support the local retail market.
- **Branding and Marketability.** Consumers should perceive BRT as a high-quality service. Vehicles should enhance the service's image and be clearly differentiated from traditional bus service. Station areas should have a distinct sense of place and create a livable community by integrating public space, active retail frontages, and pedestrian amenities.
- **Multimodal Connectivity around Stations.** Safe and convenient multimodal connections from stations to major activity centers and destinations are a key to increasing ridership and attracting riders from other travel modes. Pedestrian and bicycle connections support internal circulation within stations and access to BRT stations from the surrounding area. Efficient and convenient intermodal connections and transfers to feeder bus services should be available.
- **Competitiveness with Automobile Travel.** Travel time is the single most important factor in encouraging ridership among “choice” riders, who have access to an automobile for their trip. BRT stops/stations should be spaced a minimum of a half-mile apart, although stations are typically a mile or more apart. To maintain competitive travel times, service design should balance speed (longer stop spacing) with the maximum distance customers are willing to walk (shorter stop spacing). This distance is generally considered to be up to a half-mile for frequent, high-quality service.



RANDALL/ORCHARD CORRIDOR CONDITIONS

The Randall/Orchard Road corridor runs for approximately 31 miles between the north and south boundaries of Kane County, west of the downtowns of Fox Valley municipalities (see Figure ES-3). By car, travel time along the corridor is slightly more than an hour from end-to-end under normal driving conditions. There is significant demand for access to destinations along the corridor, segments of which carry up to 60,000 vehicles per day.² Land use along the corridor is a mixture of suburban and rural character with primarily retail and commercial uses directly along the corridor and pockets of undeveloped and/or agricultural lands. There is significant residential development along the corridor, consisting primarily of low-density single-family dwellings. There are several concentrations of major employers and industrial parks. Medical institutions are a major presence in Kane County, including Sherman and Delnor Hospitals, located directly on Randall Road, and Provena St. Joseph Hospital and Provena Mercy Medical Center which are located near the corridor.

Figure ES-1 summarizes opportunities and constraints with respect to development of BRT along the Randall/Orchard Road corridor. In particular, key factors in the success of BRT or any other transit system along the corridor include:

- Evolving from mostly single-use development to mixed-use residential and employment activities at sufficient intensities around identified station nodes to support frequent transit service.
- Integrating BRT service with local transit routes serving the east-west corridors that connect Randall Road with residential areas and the downtowns of Fox Valley municipalities.
- Improving pedestrian conditions (sidewalks and crossings) along Randall Road and providing convenient multimodal (transit, bicycle, and/or pedestrian) access between station areas and adjacent residential developments or destinations located off of the corridor.
- Marketing BRT as a premium service to create a positive image for BRT, changing existing attitudes, and attracting riders.

Chapter 2 of the Final Report provides a detailed discussion of Randall/Orchard Road corridor conditions.

² Kane County 2040 Transportation Plan

Figure ES-1 Opportunities and Constraints

Opportunities
<ul style="list-style-type: none">• Higher-density major institutions along or near the corridor that can potentially anchor a major transit node, including:<ul style="list-style-type: none">– Sherman, Delnor and Mercy Hospitals—growing service centers that are open 24 hours a day.– Elgin Community College, Aurora University, and Waubensee Community College (including satellite campuses).• Underdeveloped commercial strips without a major anchor that can be more easily assembled into larger redevelopment.• Large retail developments with limited lifetimes that can be developed or repurposed.• Higher-density development along the corridor (including undeveloped or agricultural land) could support preservation of agricultural land and open space outside of the corridor.• Significant right-of-way exists to develop transit and pedestrian infrastructure along the corridor.• Regional trails along the corridor provide alternative access to the street network.• Connections to two major interstates with BRT potential.• Proximity to Metra stations and urban areas.• Increased congestion and higher energy prices in the future would incentivize use of BRT.
Constraints
<ul style="list-style-type: none">• Existing pedestrian infrastructure that is not supportive of transit, e.g., building fronts setback from the corridor, large parking lots oriented to the corridor, and lack of sidewalks.• Low-density residential developments poorly connected with the corridor.• Relatively long signalized intersection spacing and no/few crossing opportunities between intersections.• Low-density, less transit-intensive public or private institutions that are not conducive to redevelopment, e.g., primary schools, religious institutions.• Land use policies and incentives require coordination among multiple jurisdictions along the corridor (also an opportunity).

CONCEPTUAL RANDALL/ORCHARD CORRIDOR BRT

BRT Conceptual Station Areas

Twenty-seven attendees representing study area municipalities, Kane County Board and staff, Pace, Metra, the RTA and CMAP participated in a corridor visioning workshop held on October 26, 2010. Participants suggested locations for compact mixed-use development around BRT stations and types of development that could be realized at each. The project team synthesized this input into a set of 13 conceptual station locations along a *minimum operable segment* (MOS)³ as well as several additional stations and/or terminus locations outside of the MOS. Figure ES-3 illustrates the conceptual alignment and stations.

A mix of residential, commercial, and institutional uses was assumed for each station area (considered to encompass up to a half-mile radius) based on input from the visioning workshop, BRT design principles, and best practices for Transit-Oriented Development (TOD). The project team designed this mix to demonstrate that corridor station areas could accommodate 40% of growth envisioned for the County's Sustainable Urban Area—nearly 19,000 households (about 55,000 people) and 29,000 jobs (top row of Figure ES-2).⁴

Station Area Land Use Assumptions

The assumptions used in developing the conceptual station area land use mix include:

- A range of residential development intensity ranging from medium-low densities (6-10 dwelling units per acre) to high densities (18-22 units per acre).
- A variety of commercial uses (e.g., office, retail/services, institutional, etc.) and development intensities.
- At least 5% of net buildable land would be used for public uses, e.g., plazas or open space.
- Existing residential development and major institutional buildings would not be redeveloped in the 2040 time frame, but existing commercial uses could be redeveloped at higher-densities or with a different mix of uses.

The second and third rows of Figure ES-2 compare estimated future population and employment potential within the conceptual MOS station areas to the level targeted for the corridor. The conceptual land use mix within the MOS accommodates 93% of population growth and 143% of employment growth targeted for the corridor.⁵ Additional growth could be accommodated in stations outside of the MOS.

Figure ES-2 Conceptual Station Area Demographics (Minimum Operable Segment)

	Population	Households	Total Jobs
Targeted Corridor Growth*	55,261	18,880	28,790
Conceptual Station Area Demographics	51,266	17,515	41,226
Conceptual Station Areas: % of Corridor Targeted Growth	93%	93%	143% ⁵

* 40% of growth projected for Sustainable Urban Area, from the County's 2040 Plan

Chapter 3 of the Final Report provides a detailed discussion of conceptual BRT service and station area development.

³ For transit projects, an MOS is considered to have independent utility and logical termini, meaning that it is able to provide substantial transportation benefit as a complete route.

⁴ Kane County's vision for growth, as described in the 2030 Land Resource Management Plan and the 2040 Conceptual Land Use Strategy Report, is to accommodate 50% of overall growth in the county's Sustainable Urban Area in accordance with the Smart Growth and Livability Principles.

⁵ The employment capacity estimated in this scenario exceeds targeted growth because jobs generated by existing land uses would be replaced by new land uses assumed under the BRT development scenario. No replacement of existing residential uses is assumed.

Figure ES-3 Conceptual BRT Station Areas and Alignment



Conceptual BRT Costs

Preliminary, conceptual costs to construct and operate BRT along the defined minimum operable segment were developed based on experiences with other BRT systems. The vetting of the project through a more formal planning and development process⁶ is required to produce refined cost estimates.

Capital Costs

Figure ES-4 details conceptual capital costs required to implement BRT service in the Randall/Orchard Road corridor MOS, including BRT vehicles, roadway improvements, development of BRT stations and passenger amenities, and engineering, design work and contingencies.

These costs assume that BRT will run in general purpose travel lanes with queue jump lanes at 14 key signalized intersections and Transit Signal Priority (TSP)⁷ to provide transit travel time improvements. The total implementation costs can be expected to be about \$40 million in current (2012) dollars.

Figure ES-4 Conceptual Capital Costs

Element	Total Cost (2012 dollars)
Vehicles (21 stylized/articulated @ \$927,400 including spares)	\$19,475,000
Running Way & Intersections (Queue Jumps and Signal Priority)	\$5,508,000
Stations and Amenities (13 MOS Stations)	\$6,689,000
Engineering, Design, and Construction Management	\$4,148,000
TOTAL ESTIMATE *	\$39,479,000

* Includes 30% contingency on all items except vehicles

Operating Costs

The estimated cost of operating BRT service in the MOS alignment is based on a relatively high level of service that would be required to attract choice riders (those not dependent on transit). Figure ES-5 details the assumptions used in developing the cost estimate.

The annual cost of operating BRT with this level of service is about \$8.5 million. Reducing peak or night service frequency and/or hours would reduce operating costs.

Figure ES-5 Operating Assumptions and Estimated Operating Cost

Operating Plan Element	Assumed Level of Service
Hours of Operation (Service Span)	5 AM until Midnight (seven days a week)
Frequency (Headway)	Peak: 10 minutes (six hours per weekday) Off-peak/Early Evening/Weekend: 15 minutes Night (30 minutes)
Annual Revenue Hours	81,670
Peak Vehicles in Service	17
Annual Operating Cost (MOS)	\$8,494,000 (2012 dollars)

⁶ Larger BRT projects are typically planned using the Federal Transit Administration's New Starts Project Planning & Development process which dictates establishment and refinement of financial plans. www.fta.dot.gov/12347_5221.html

⁷ The BRT Primer in Appendix C and the Microsimulation Modeling section of Chapter 4 of the Final Report provide further background information on queue jump lanes.

BRT BENEFITS

Transit agencies and communities in North America implement BRT to improve transportation mobility and leverage broader policy aims including promoting economic development, sustainability, and community livability. Studies of BRT service have demonstrated substantial time savings and increases in transit ridership relative to conventional bus service, as well as the community benefits summarized in Figure ES-7.

Evaluation Approach

The project team utilized the travel demand model developed for the County's 2040 Transportation Plan (macro-simulation) and traffic operational analysis (micro-simulation) to evaluate the projected effects on travel patterns resulting from the conceptual BRT station area developments and implementation of BRT service in 2040.

The scenarios described in the sidebar at right and Figure ES-6 (below) were analyzed to compare conditions in 2040 with and without BRT service in the Randall/Orchard Road corridor under different growth and land use assumptions. The moderate level of growth in identified in Figure ES-6 represents the allocation of households and jobs in the conceptual BRT station areas to the analysis zones used for transportation modeling.

Evaluation Scenarios

- 2040 Transportation Plan.** This scenario assumes only traditional local bus service along the corridor, with a 4.3% transit mode split. It assumes traditional land use patterns with the baseline level of population and employment growth from the County's 2040 Transportation Plan. It is assumed that the Randall/Orchard corridor has been widened to three lanes in each direction.
- Corridor-Focused Development.** This scenario also assumes only traditional local bus service, but a higher level of growth that is more intensive and nodal in character. It assumes the same moderate increase in population and jobs as in the BRT scenario, but not necessarily as focused in station areas or designed to be compact and highly walkable.
- BRT/TOD.** This scenario assumes an increase in the transit mode split along the corridor from 4.3% to 13.5% with the introduction of BRT service in 2040, assumed to operate in mixed-traffic with queue jumps. Transit-oriented development (TOD) is assumed in the conceptual BRT station areas, representing medium-density, mixed-use development with pedestrian-oriented, walkable design. There is moderate growth in the level of population and jobs in station areas. Given the development of safe and convenient pedestrian and bicycle connections in station areas and along the corridor, it is further assumed that a subset of short trips originating and ending in BRT station areas will shift to active transportation (walking and bicycling).

Figure ES-6 2040 BRT Scenario Characteristics

Scenario Name →	2040 Transportation Plan	Corridor-Focused Development	BRT / TOD
Scenario Characteristics →	2040 Local Bus w/ Baseline Growth & Baseline Land Use	2040 Local Bus w/ Moderate Growth & Corridor-Focused Development	2040 BRT w/ Moderate Growth & TOD
Level of Corridor Growth by 2040¹	Baseline Growth	Moderate Growth	Moderate Growth
Households (growth vs. baseline ²)	16,700	28,400 (+11,700)	28,400 (+11,700)
Jobs (growth vs. baseline ²)	30,600	65,600 (+35,100) ³	65,600 (+35,100) ³
Transit Service	Local Bus	Local Bus	BRT and Local Bus
Assumed Transit Mode Split ⁴	4.3%	4.3%	13.5%
Land Use/Development Patterns in the Randall/Orchard Corridor	Traditional (no TOD)	More intensive and nodal than baseline	TOD ⁵ in BRT station areas

Notes: (1) Baseline growth for the corridor is from forecasts developed for the Kane County 2040 Transportation Plan, based on data developed by CMAP for the GO TO 2040 Plan. Moderate growth is based on conceptual land uses assumed for corridor MOS station areas and the vision for growth articulated in the 2040 Conceptual Land Use Strategy Report and the 2030 Land Resource Management Plan (see page ES-5). (2) Additional households/jobs are relative to the 2040 Transportation Plan baseline for 2040 and reflect a reallocation of growth within the County. (3) Job growth includes some redevelopment of existing jobs. No redevelopment of residential areas was assumed, therefore all residential growth is in addition to the baseline. (4) Mode split is the share of all trips carried by a particular type of transportation. The baseline 4.3% mode split is from regional projections in CMAP's GO TO 2040 Plan, and is for trips accessing the corridor. A 13.5% mode split is assumed with BRT service, which includes an 18.2% mode split (based on a 2011 BRT Study by the Metropolitan Planning Council) for trips between station areas. (5) Transit-oriented development (TOD) refers to higher-density, mixed-use development and pedestrian-oriented, walkable design.

The BRT Primer (Appendix C of the Final Report) and Chapter 4 of the Final Report discuss BRT benefits generally and for the corridor.

Figure ES-7 Benefits Realized from BRT and Supportive Land Uses

Benefit Category	Measure(s)	Explanation/Importance
Congestion Mitigation / Traveler Delay Reduction and Cost Savings	Daily travel time savings - drivers and transit users	Drivers may realize travel time benefits due to reduced congestion. Transit users will realize time savings with BRT relative to conventional bus service and/or driving.
	Cost savings relative to driving	Transit users and those who walk and bike will realize cost savings relative to driving.
Transportation-Related Energy Usage and Emissions	Reduction in fuel usage due to compact development	Compact development reduces fuel consumption by enabling more non-SOV trips and shorter SOV trips, as well as use of walking and bicycling for short trips.
	Reduction in greenhouse gas (GhG) emissions	Per-capita GhG emissions are lower due to reduced VMT from trips that shift to BRT.
	Reduction in emissions of other pollutants that impact air quality (e.g., NOx, PM2.5, SO2, CO, VOCs)	Air quality is improved due to reduced VMT.
Community Health Impacts	Improved health outcomes due to improvements in air quality	Reduced driving, and in particular fewer short trips, reduces concentrations of airborne pollutants that affect human health.
	Improved health outcomes due to physical activity from walking and bicycling	“Active transportation” to access BRT and services in mixed-use development increases physical activity and improves health outcomes including lower risk of cardiovascular disease, stroke, colon and breast cancer, and onset and treatment of type II diabetes.*
	Improved safety due to reduction in driving (VMT)	Reduced driving and improvements in roadway design enhance safety for drivers and other road users (pedestrians/bicyclists).
Land Use	Reduction of urbanized land required	Compact development patterns utilize land more efficiently and reduce amount of urbanized land required to support station area development.
	Reduction in required parking supply	Reduced cost of building and maintaining parking spaces.
	Reduction in infrastructure costs	Compact development patterns reduce the cost of providing and maintaining public infrastructure.
Economic Development	Number of jobs generated/supported	Capital investments in BRT infrastructure support local construction, planning and design jobs. Ongoing annual BRT operations also supports jobs.
	Increased economic productivity and opportunities	Investments in high-capacity transit stations and other infrastructure improve access and attract development.
	Revitalization and increase in land values	Transit-oriented development in conjunction with high quality transit service increase land values and the tax base on nearby parcels.

* Cavill, N. et al. Economic assessment of transport infrastructure and policies. Methodological guidance on the economic appraisal of health effects related to walking and cycling. Copenhagen, WHO Regional Office for Europe, 2007.

BENEFITS EVALUATION

Key Findings

The benefits enumerated below are estimated for 2040 in the BRT/TOD scenario relative to either the 2040 Transportation Plan scenario or the corridor-focused development scenario (same moderate level of population and employment growth as the BRT scenario, but with traditional local bus service).

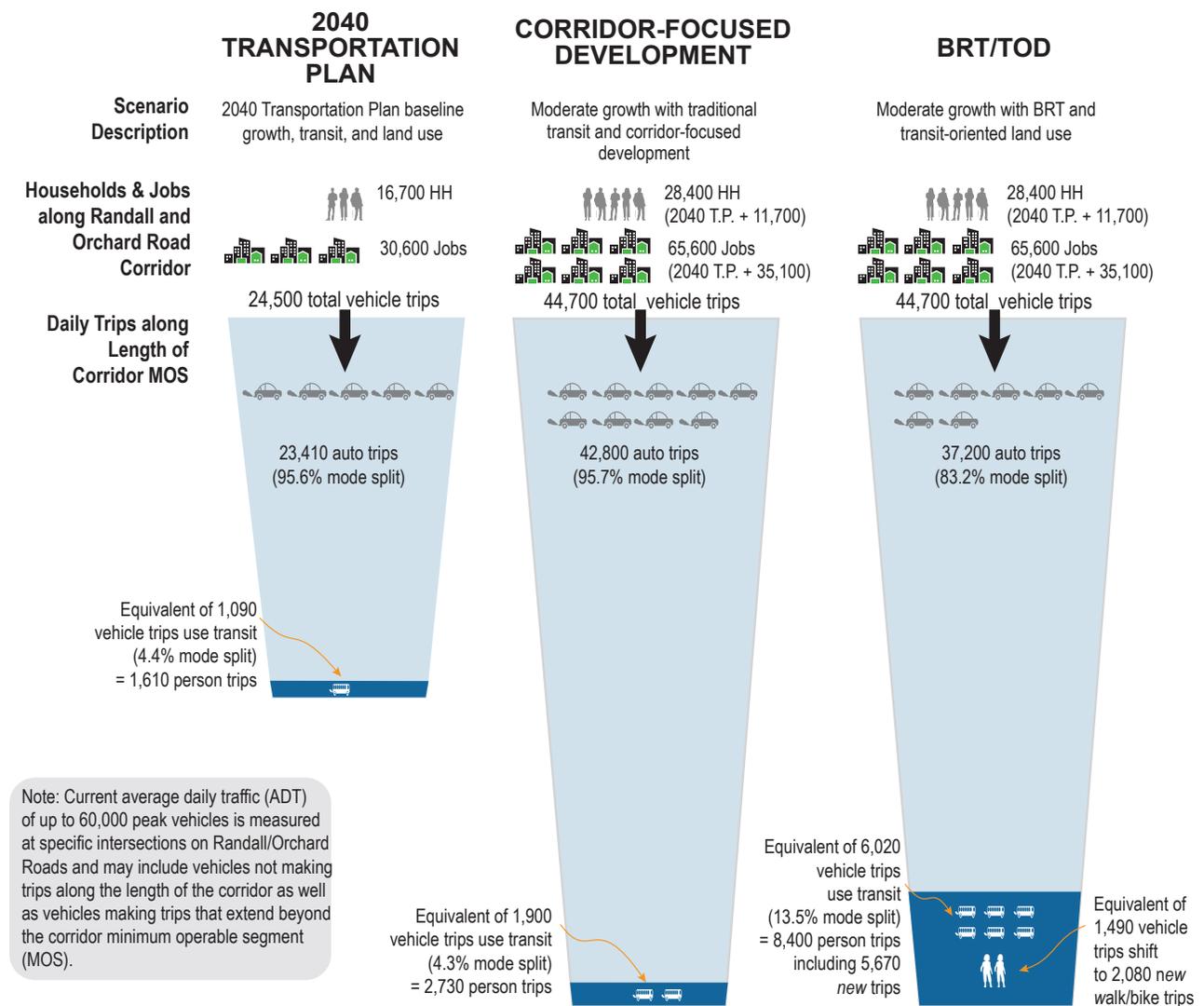
Travel Patterns

Compared to the 2040 Transportation Plan scenario:

- The travel demand model predicts an additional over 5,600 new transit trips in the corridor with BRT service and transit-oriented development (see Figure ES-8).
- Overall VMT in the Randall/Orchard Road corridor MOS increases by 0.8%, but VMT per capita decreases by 15.5%. County-wide VMT decreases by 1.6% overall, and by 3.5% on a per capita basis.

Due to the travel demand model's limited ability to anticipate the effect of compact development and a mix of uses in enabling shorter trips, these figures likely do not account for the full potential to reduce overall VMT, which research has shown to range from 12% to 25%.

Figure ES-8 Projected Number of Auto and Transit Trips in Randall/Orchard Corridor MOS, 2040



Congestion Mitigation (Traveler Delay and Cost)

Relative to the corridor-focused development scenario:

- **Operating BRT vehicles in mixed-traffic, with queue jumps** at 14 key intersections along the corridor, enables BRT travel times that are competitive with driving, without adverse impacts on autos:
 - Bus travel time decreases by 26% during afternoon peak hours.
 - Bus riders save an average of five minutes per trip compared to traditional bus.
 - Travel time for drivers decreases by 13%, or 1.9 minutes on an average trip. This is because queue jumps also function as right-turn lanes for all vehicles.
 - Bus riders (existing and new) and drivers collectively save over 1,400 daily travel hours.
- **Operating BRT vehicles in a third, transit-only travel lane** on Randall Road results in an average trip on BRT being four minutes faster than driving, but increases auto travel times:
 - Bus travel time decreases by 45% during afternoon peak hours.
 - Bus riders save an average of eight minutes per trip compared to traditional bus.
 - Travel time for drivers increases by 35%, or about five minutes on an average trip.
 - The net effect (considering drivers and new and existing bus riders) is an increase of nearly 2,400 daily travel hours; this is because auto travel times increase and driving still accounts for the majority of corridor trips.
- Considering only direct monetary costs, in either scenario there is an annual costs savings of \$600 per new BRT rider compared to driving, based on an average trip in the corridor.
- Mixed-traffic BRT operations with queue jumps is assumed for the evaluation of BRT benefits, with the exception of the travel time analysis.

Energy Usage and Emissions

Relative to the corridor-focused development scenario:

- The shift of auto trips to BRT, walking, and bicycling saves nearly 329,000 gallons of gasoline annually, assuming projected 2035 improvements in fleet fuel efficiency, and reduces greenhouse gas (GhG) emissions by nearly 3,100 CO₂-equivalent metric tons annually in the Randall/Orchard Road Corridor, a reduction of about 3.1%.
- Based solely on the modeled county-wide reduction in VMT, county-wide GhG emissions

from auto travel are reduced by about 2%. This county-wide comparison highlights the impacts of the reallocating county-wide growth to the corridor.

- GhG emissions from BRT vehicles exceed the estimated reductions in corridor emissions, but comprise just 9% of the county-wide reductions. The estimates for BRT vehicles also conservatively assume the current fuel-efficiency of current hybrid-electric buses. Hybrid, or more efficient, bus technology should be economically feasible by 2040.
- This shift of auto trips to BRT, walking, and bicycling has a relatively marginal effect in reducing regional air pollutant emissions, as a result of emerging stringent emissions standards. These results are based on average emissions factors, however, more detailed modeling would be needed (as part of a detailed planning process) to accurately estimate overall and localized benefits. BRT's contribution to air pollutant emissions is comparatively small.

Community Health Impacts

Reducing auto trips also reduces concentrations of air pollutants, which research shows results in health benefits including lower mortality and improvement in various health outcomes. Relative to the corridor-focused development scenario:

- The monetary benefit of walking and bicycling (for accessing transit and taking short trips) is estimated at over \$980,000 annually, including both mortality and the effects of disease/injury. This is based on 125 annual miles of walking or over 185 annual miles of biking per person making these trips.⁸
- A small reduction in fatalities and injuries (about 3%) is estimated based on the reduction in VMT. BRT-related fatalities and injuries offset about 5% and 20% of the reductions in auto-related fatalities and injuries, respectively. The calculation is based on national average fatality and injury rates for passenger car and bus occupants.

Land Use

Relative to the corridor-focused development scenario:

- Moderate-intensity station area development would reduce the amount of land utilized by over eight square miles, about equivalent to the land area of the city of Geneva.
- Forty fewer acres of surface parking land area would be required, saving nearly \$2.4 million in annual parking operations and maintenance costs.

⁸ These trips were assumed to be an average of a half-mile for walking (year-round) and 1.5 miles for biking (limited to dry-weather months).

- In general, infrastructure costs in “compact development” that is contiguous with the urban edge are estimated to be 75% to 95% of such costs in “sprawling” development patterns.

Economic Development

- BRT construction and other one-time capital elements could support up to 300 jobs (excluding vehicles, which it is assumed would not be available locally). Over 300 jobs could be supported by ongoing BRT operations.
- Other economic benefits of BRT include increased productivity, access to employment and educational opportunities, revitalization of existing commercial area, and increased property/land values.

Summary of Impacts

Figure ES-9 summarizes the comparisons between the BRT/TOD scenario and the 2040 Transportation Plan and corridor-focused development scenarios for various transportation modeling results and categories of benefits.

Figure ES-9 Summary of BRT Benefits: BRT/TOD Scenario Compared to Other Scenarios

Geography	Corridor MOS		County-wide	
	BRT/TOD relative to: 2040 Transportation Plan	Corridor- Focused Development	BRT/TOD relative to: 2040 Transportation Plan	Corridor- Focused Development
Population	28,400 HH (+11,700)	same	N/A	N/A
Employment	65,600 jobs (+35,070)	same	N/A	N/A
VMT	+0.8%	-1.5%	-1.6%	-2.0%
VMT per Capita ¹	-15.5%	-1.5%	-3.5%	-2.0%
Overall Travel Time Savings ²				
Queue Jumps	N/A	-13% (savings)	N/A	N/A
Exclusive Lanes	N/A	+20% (increase)	N/A	N/A
Annual cost savings per new transit rider relative to driving	N/A	\$600	N/A	N/A
Fuel Consumption and GhG Emissions – Passenger Vehicles ³	N/A	-3.1% ⁴	N/A	-2.0% ⁵
Community Health Impacts	N/A	Decrease in auto-related injuries, improved health outcomes	N/A	N/A
Land Use	N/A	Decrease in land consumption, parking requirements	N/A	N/A
Economic Development	N/A	Increase in jobs	N/A	N/A

Notes: ¹ Per capita refers to the population contributing to Randall/Orchard Road corridor or county-wide VMT. ² Includes drivers and existing and new transit users. ³ Does not include BRT vehicles. ⁴ Calculated based on the number of trips that shift to BRT, walking, and bicycling. ⁵ Based on the modeled change in county-wide VMT from the Kane County travel demand model.

CONCLUSIONS AND NEXT STEPS

Conclusions

This study assesses the overall viability of bus rapid transit in the Randall/Orchard Road corridor. It assumes a 6-lane roadway system with queue jumps and transit signal priority and illustrates a set of conceptual station area developments needed to support the potential transit system investments. The study highlights that BRT along the Randall/Orchard Road corridor can be an element of a comprehensive strategy for transforming land uses in Kane County. By focusing some of the expected county-wide growth into transit-oriented developments at select BRT station areas, corridor residents, workers, and visitors will have additional transportation options available to them, reducing the existing reliance on automobile travel. While the overall travel demand in the corridor would grow, many of these trips will be shorter and could be made via transit, bicycling, or walking.

The resulting changes in travel patterns would help the County realize a number of benefits including:

- Reduced travel times and transportation costs, especially for those taking transit
- Reduced fuel consumption and greenhouse gas emissions
- Reduced traffic fatalities and an increase in healthy lifestyle activities
- Decreased land use consumption
- Increased economic activity in the corridor

Next Steps

While the study illustrates a conceptual long-term vision for the corridor, near-term steps will be required to reach consensus on future land use policies and ensure that short-term land use development does not preclude future TOD along the corridor. A number of factors will present challenges when developing the final vision for the corridor and identifying the action items needed to realize the vision. These include:

- Multiple private land owners at potential station areas
- Multiple jurisdictions governing land use and other standards/policies for the corridor
- Varying degrees of local support for TOD and transit system investments
- The historic role of Randall Road which was seen as incompatible with the Complete Streets principles⁹ required in a primary transit corridor

Critical next steps in the process include:

- Cultivating political and public partnerships to identify and promote supporting policies
- Conducting outreach to land owners and community members about the vision and necessary actions to achieve it
- Identifying public investments in the transit system, pedestrian and bicycle connectivity, and station area developments, along with sources of funding
- Codifying supporting policies in comprehensive plans and zoning codes as soon as possible to provide a roadmap for future development and retain options for station area development
- Refining transit and roadway designs as future land use decisions take shape

⁹ Complete streets are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Complete streets design guidelines and make it easy for pedestrians and cyclists to access activities along the street and to cross the street, while supporting the movement of motorized vehicles.