



Sustainable Customer Transportation

An Opportunities Guide for Retailers and Shopping Centers

Developed through the WWF-IKEA Global Partnership's Sustainable Transport of People Project

Credits

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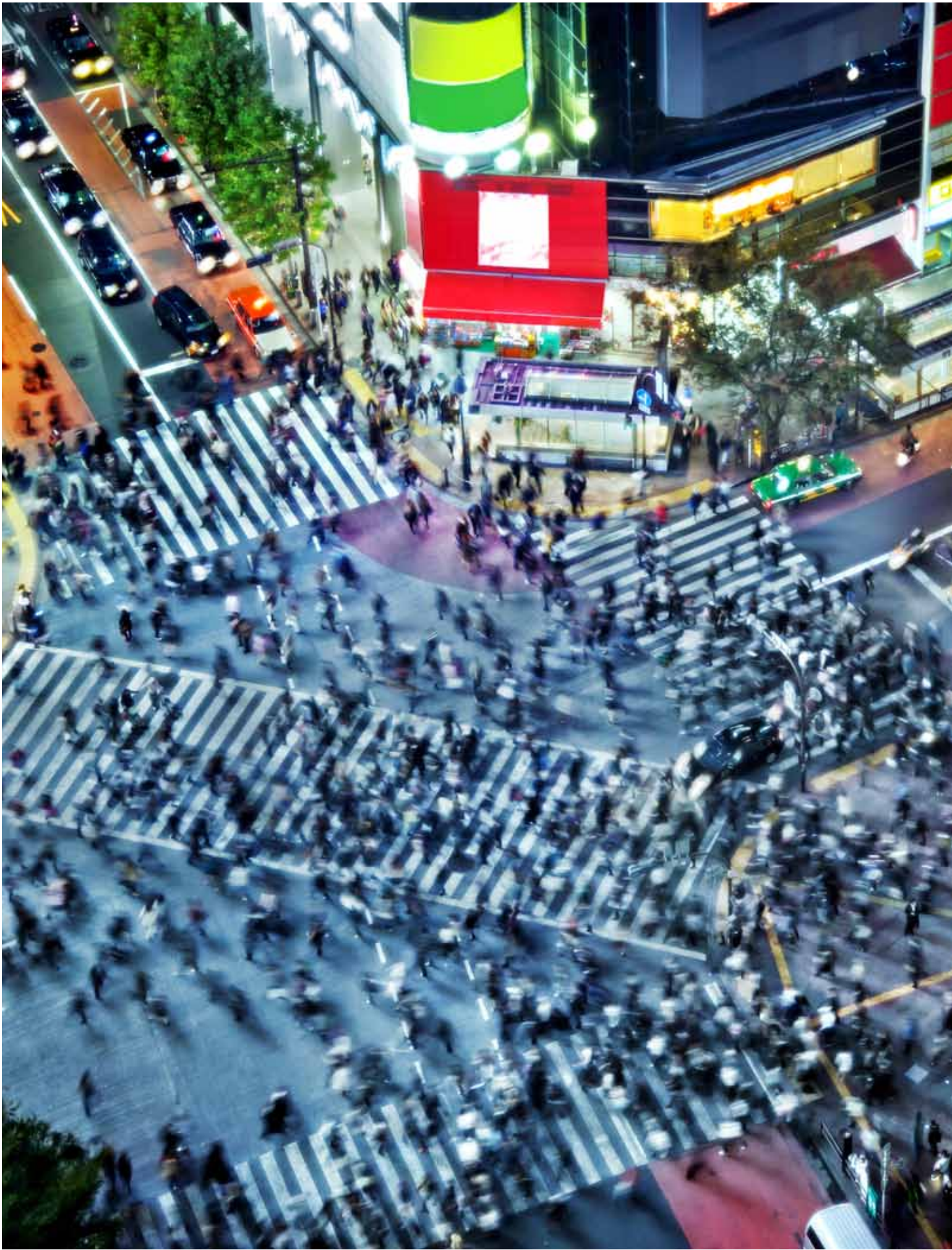
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About This Guide

As communities look for viable ways to build environmental, social, and economic sustainability, alternative, lower-impact transportation systems are part of the solution. Today, transportation is responsible for 20 to 25 percent of the world’s energy consumption and carbon dioxide emissions. By creating sustainable transportation options—from greater walkability to more efficient public transportation systems to transport-sensitive development—communities can improve people’s access to work, leisure activities, goods and services, and other needs while reducing transportation’s significant carbon footprint.

Many companies want to give their customers and employees more sustainable transportation options and at the same time contribute to building sustainable communities. *Sustainable Customer Transportation: An Opportunities Guide for Retailers and Shopping Centers* provides the inspiration and practical advice they need to get started.

“Sustainable Transport of People” is a joint project of IKEA and World Wildlife Fund that began in 2007. This project explores ways to reduce the carbon footprint of “people transportation”—travel to and from stores by customers and employees, and delivery of purchased products—and seeks to contribute proactively to a societal shift to less carbon-intensive consumer travel. IKEA is currently considering recommendations from the project’s analysis of carbon reduction opportunities as input to a potential global Sustainable Transport of People strategy; its involvement should not be interpreted as a commitment.

Designed for store managers, business expansion teams, and sustainability officers, especially in the retail sector, this guide has two objectives:

1. To explain the environmental and business rationale for sustainable customer transportation
2. To propose strategies and emissions-reduction targets for increasing sustainable transportation use

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1. Why Customer Transportation Matters

Customer transportation for shopping leaves a significant carbon footprint. Commuting accounts for only 15 percent of car trips in the United States, so a significant portion of carbon emissions from transportation is based on optional car trips.¹ For retail companies, customer transportation can be a significant source of indirect emissions. For example, customer transportation to IKEA stores produced more than three times the energy emissions of all IKEA buildings in 2010.² Many other companies—not just big-box retailers—rely heavily on customers who drive private vehicles to shop at their stores. Even for companies like food retailers, the distance between customer and store may be short, but the frequency of travel adds up to a large environmental impact.

In addition to the environmental benefits, there are significant business drivers for reducing customers' dependence on carbon-intensive private vehicle use:

- Avoiding reliance on customers who drive to shop. Fuel price spikes or increases over time may make people less willing to drive their personal vehicles. Government programs to reduce traffic congestion could also limit consumers' ability or inclination to travel by car.
- Avoiding missed revenue and providing better access to potential customers who lack easy means of transport. Some consumers—for example, low-income families, students, city dwellers, elderly and disabled people—may not own cars.
- Keeping the shopping experience convenient. The inconvenience of traffic and parking has a negative impact on the customer's shopping experience, while easy access or incentives for sustainable transportation make shopping more positive.
- Changing limitations on land acquisition and development. In some regions, companies must now consider city center locations and new store formats where space for parking may be limited.
- Sharing costs, risks, and benefits of common transport. Developing and locating stores in shopping centers gives businesses an opportunity to increase mass transit and home delivery use in cooperation with other retailers.
- Emerging leadership opportunities. Few companies have sought remedies to the problem of sustainable customer transportation, so there is a chance to take a leadership, trendsetting, and brand-building position in addressing this important issue.

¹ Tom Vanderbilt, "Living Large, Driving Less," *Sierra*, July/August 2011, p. 42.

² *IKEA Sustainability Report 2010*, p. 74.





2. Eight Ways Retailers Can Contribute to Sustainable Transportation

Companies have many options for addressing the environmental impact of transporting people and products. This chapter outlines eight potential opportunities for reducing carbon emissions in different segments of retail transportation.

1. Smart Shopping

Smart shopping involves using the company website to inform customers about products and services before they arrive at the store. It can complement the in-store shopping experience while significantly reducing carbon emissions. Browsing the website first can help customers plan for their trip and avoid making multiple trips to finalize their purchases. If products, styles, measurements, colors, and similar information are available online, along with information about alternative transportation to the store, home delivery services, and locations of nearby stores and amenities, then customers can design a more efficient shopping trip.

2. Multiple Stops per Trip

Shoppers can avoid extra car trips when they combine several errands in a single trip. From a carbon-accounting perspective, emissions are a shared responsibility of all the companies the consumer visits on a particular trip. If an IKEA customer also visits a home improvement center, for example, IKEA is responsible for only part of the emissions because the customer planned the trip to include both errands. One way for retailers to encourage multiple stops per trip is to locate stores in shopping centers and closer to town centers.

3. Home Shopping

When customers buy products online, they save a shopping trip and reduce emissions by saving a trip to the store. Emissions from delivery typically are minimal because the delivery truck carries multiple packages, thereby reducing the emissions attributable to each one. The project's analysis shows that home shopping can reduce average emissions per purchase by 77 percent compared to purchasing in an IKEA retail store.³ It has the additional benefit of reaching customers who cannot or choose not to travel to the store.

³ “WWF/IKEA Sustainable Transport of People 2: Customer Transport Emissions—Revised Baseline & Reduction Scenarios,” project report, Jason Denner and Ty Colman, Point380 Consultants, September 30, 2010, p. 10.

4. Improved Long-Haul Efficiency

Because every product involves long-haul transportation, improving trucks' fuel efficiency results in an overall emissions reduction. The impact of long-haul transportation varies depending on whether the purchase occurs in a store or online and whether home delivery originates from a store, a manufacturer, or a distribution center. These complex relationships should be considered so that carbon reductions are real and not just shifted from one area like customer transportation to another like long-haul transportation.

5. Mass Transit and Alternative Transportation

When customers can reach a store easily by mass transit or alternative transportation, such as walking, biking, or carpooling, the company reduces the environmental impact of customer transportation. Based on findings from pilot stores in the Sustainable Transport of People Project, using mass transit and home delivery reduces average carbon emissions by 42 percent compared to driving a private vehicle to the store.⁴ Home delivery is included in this analysis because IKEA products are often too large to carry home by alternative transportation.

Just being accessible is not enough. Retailers should design visible multimedia promotion initiatives that inform customers about alternative transportation options. Company websites, media campaigns, advertising, and in-store announcement boards are all good methods. Two good examples are the mass transit directions to IKEA in Brooklyn, New York (<http://info.ikea-usa.com/Brooklyn/StoreDirections.aspx>), and the carpooling website for IKEA stores in France (<http://covoiturage.ikea.fr/>). Raising awareness about home delivery services could be part of a promotional message for companies selling bulky products. Incentive programs offering home delivery discounts, free shuttle service with purchases, or transit fare reimbursement also encourage mass transit use.

Sometimes stores are not easily accessible by alternative transportation. Retailers can work with municipalities to provide or improve mass transit service, or they can invest in shuttle service to stores from city centers or mass transit stations. Groups of businesses in a neighborhood or shopping center could share the expense. Citizen groups can be helpful allies when working with municipalities to provide lower-carbon transportation solutions such as bike lanes and sidewalks.

6. Store Location

A store's location is the single most important factor in determining its carbon footprint from people transport emissions. When choosing new locations, accessibility and emissions impact should be high priorities. Considerations include customers' average travel distance to the store, connectivity to transportation alternatives, and proximity to other businesses to enable multiple-stop trips. Shopping centers, with their larger customer base, offer opportunities

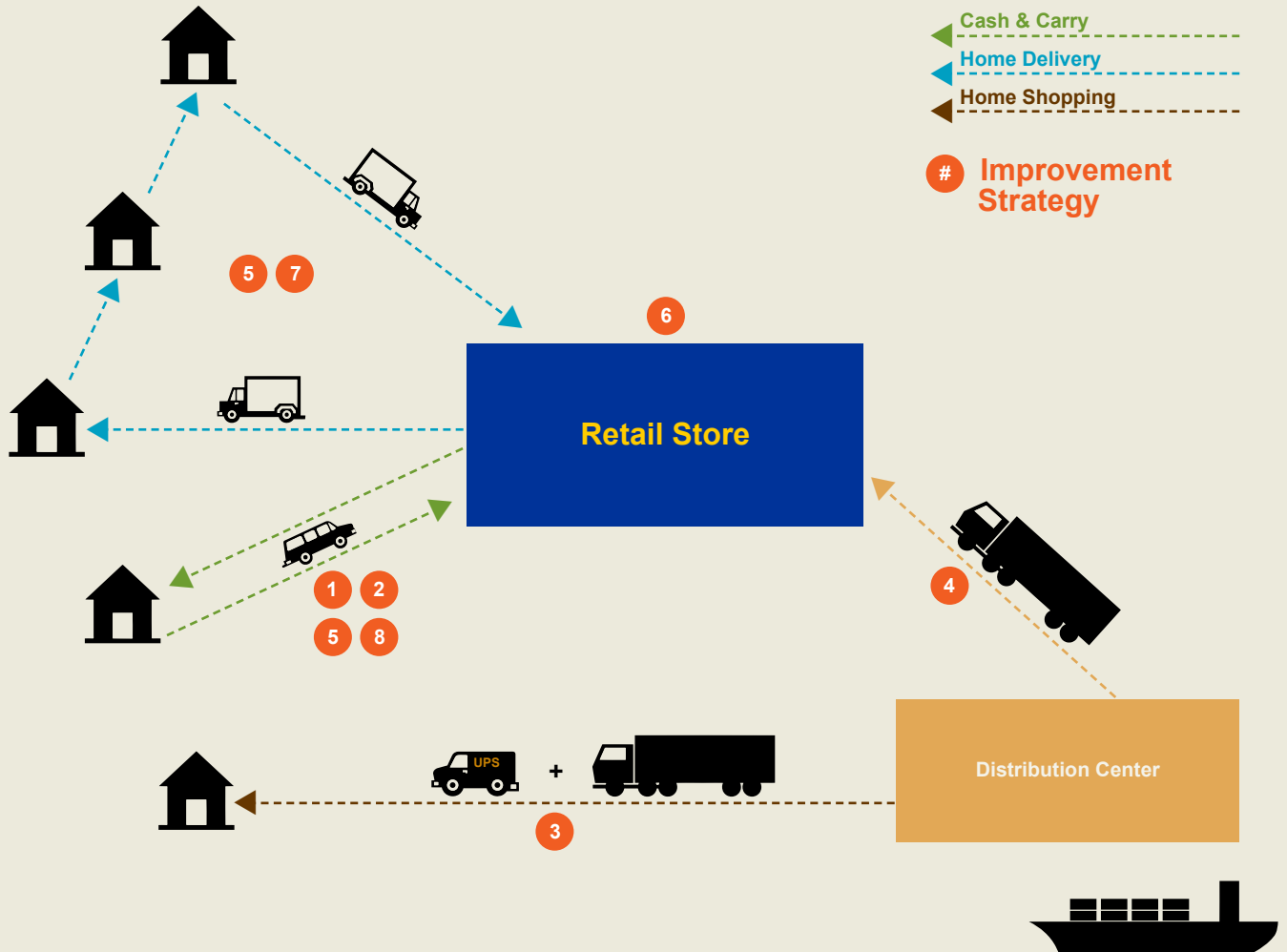
⁴ Ibid., p. 11.

**Retail
Transportation
Improvement
Strategies
Analyzed in the
WWF-IKEA Project**

KEY:

-  Cash & Carry
-  Home Delivery
-  Home Shopping

Improvement Strategy



for expanded mass transit options, such as shuttles and better-utilized home delivery services. Redeveloping existing properties or industrial sites near population centers can provide economic benefits to a city and improve access for customers.

Municipal land development policies combined with land prices often promote development on the far outskirts of cities, creating yet another reason an individual or family may want to buy a car. Growing car ownership in developing countries will place huge demands on roadway and fuel infrastructure and result in significant additional carbon emissions. Companies that can demonstrate the economic and environmental benefits of more-accessible locations may be able to work with municipalities to find reasonable deals on alternative sites. In fact, municipalities in some markets are already requiring retailers to locate closer to town centers to maintain the vitality of those areas.

7. Efficient Home Delivery

Some companies—especially those that sell bulky products—can reduce their carbon emissions through home delivery services that complement other sustainable transportation strategies. Stores can promote home delivery to customers who typically drive a large vehicle to bring home their purchases. The project’s analysis shows that switching from a private truck to a private car with home delivery can reduce average carbon emissions by 42 percent.⁵ Fuel-efficient or alternative-fuel delivery trucks, optimum truck fill rates, and practical route planning can also reduce per-delivery emissions. Active promotion is essential because home delivery usually becomes more efficient—with delivery trucks making more deliveries per distance driven—as more customers take advantage of it.

8. Fuel-Efficient Customer Vehicles

Stores that rely on customers who use private vehicles can encourage them to reduce their personal carbon footprint. As incentives, some stores create preferred parking spaces for hybrid, alternative-fuel, electric, and other low-emitting vehicles. An even more innovative approach is to provide electric car recharging stations, such as the recharging stations at IKEA stores in Seattle, Washington; Portland, Oregon; Carson, California; and other stores outside the United States. A program to promote fuel-efficient cars will also reduce truck usage, especially if paired with customer communications and incentives to promote home delivery service usage. Resources for determining which cars qualify as environmentally friendly include U.S. Environmental Protection Agency (EPA) SmartWay ratings⁶ and the *Fuel Economy Guide* from the EPA and the U.S. Department of Energy.⁷

⁵ Ibid., p. 13.

⁶ U.S. Environmental Protection Agency, *Green Vehicle Guide*, www.epa.gov/greenvehicles/Index.do.

⁷ U.S. Environmental Protection Agency and U.S. Department of Energy, *Fuel Economy Guide*, www.fueleconomy.gov/feg/feg2011.pdf.

Capturing Climate-Positive Opportunities

Companies can use the strategies described in this chapter to help customers reduce their transportation carbon footprint. And they can have an even wider influence on consumer transportation choices. Because the cumulative reduction achieved by influencing everyday consumer behavior can be much greater than the reduction in a company's own footprint, the company can have an overall "climate-positive" impact on society. Consider these possibilities:

- When a company promotes the use of higher-efficiency vehicles for travel to its store, people will use those vehicles for many other trips. If it installs electric plug-in stations in its parking lot, the company's success in influencing vehicle choice can be directly observed based on usage of the stations.
- A company that works with municipal government to provide public bus service to its store indirectly helps give customers better mass transit access to other stores. By raising awareness and inducing trials of new behavior, the company encourages customers to replace private vehicle trips with mass transit ones.
- A company that moves toward opening stores in mass transit-accessible or urban locations will impact other businesses that tend to co-locate with that company. The result is more sustainable customer transportation for those businesses as well.

Companies that lead the way in sustainable customer transportation have the opportunity to engage other retailers in a movement that influences consumer behavior. Together, they can have a much greater environmental and societal benefit than any single company could achieve on its own.





3. Tips for Getting Started

Every company will approach sustainable customer transportation differently depending on culture, corporate structures, business realities, opportunities, and risks. This chapter outlines some general steps.

Step 1: Opportunity Assessment

An opportunity assessment helps companies engage internally to promote sustainable transportation, identify the business risks and opportunities, and determine potential improvement strategies.

Discuss internally and find champions.

Promoting sustainable customer transportation is an opportunity to deliver a service to customers and employees, increase business, and improve accessibility. Ideally, participants from every business area will be engaged as the project develops. If full management support does not come immediately, progress can still be made by exploring what can be done with little or no capital. Start by forming a project team or steering group from the business areas that are interested, and check back with others periodically. The following groups should have a special interest:

- **Store managers.** Customer access influences store performance, especially when fuel prices rise. Store managers will have insight into which sustainable transport strategies would work for their regions and how those strategies should be implemented (for example, by working with local stakeholders, influencing infrastructure changes, or engaging local consumers).
- **Real estate/business expansion teams.** Decisions about new store locations determine connectivity to sustainable transportation options. These teams can also influence the number and type of preferred parking spaces, bus shelters, and bike parking spaces. Fewer standard parking spaces will be needed, offsetting potentially higher real estate prices.
- **Logistics and transport teams.** The efficiency of logistics and transportation affects a product's embodied carbon footprint and its cost. Once a customer purchases a product, additional energy and cost are expended to take the product home, whether it is transported by the customer, delivered from a warehouse, or shipped from the manufacturer.
- **Sustainability officers.** Companies are being held accountable not only for their own energy use but also for indirect energy use throughout their value chain. The carbon footprint of customer transportation is a highly visible area of indirect energy use with good opportunities for reductions.
- **Communications.** Internal communications ensure successful implementation of a sustainable customer transportation program and help get the message out to internal stakeholders, explaining options and value. External communications support building the brand via new programs, making customers aware of sustainable transportation options and incentives to use them. External efforts also engage municipalities or other partners in increasing sustainable transportation.

Step 1

Opportunity Assessment

- Discuss internally and find champions.
- Assess the current situation.
- Analyze opportunities.
- Estimate the carbon footprint.



Step 2

Pilot Projects

- Design the pilots and select stores.
- Implement test strategies.
- Record steps taken and identify support needed.
- Monitor and communicate results.



Step 3

Strategy Development and Implementation

- Determine a corporate strategy.
- Develop guidance tools.
- Attain buy-in from stores and management.
- Monitor progress and share experiences.

- **E-commerce and online strategy team.** A company’s web strategy can influence whether customers shop online from home and how well online product information prepares them for a store visit. Depending on logistics, online shopping can reduce the carbon footprint of getting a product home. Online information can minimize additional trips for making purchasing decisions and returns.
- **Finance department.** Investment policies can promote the development of sustainable customer transportation. For example, investment requests for new stores could be required to include adequate infrastructure for transportation alternatives such as bus stops, bus lanes, and bicycle racks in order to gain approval. The finance team may also be able to help determine investment criteria for shuttle buses or other infrastructure improvements for existing stores. These investments can have a return because they improve customer access, increase the number of visitors, and strengthen community relations.
- **Executive team.** Top-level support is an obvious advantage to a successful, well-integrated sustainable customer transportation program. Executives in operations, marketing, communications, and finance could all have an interest in promoting such a program.

Assess the current situation.

An assessment will reveal current opportunities and risks associated with sustainable customer transportation and establish a baseline against which to measure progress. Store surveys can evaluate the accessibility of stores and potential for improvement. IKEA used an online survey tool for this purpose (appendix A). Customer and employee surveys and interviews can provide insight into how people get to the store, where they come from, why they choose the mode of transportation they use, and what would change their behavior. If the sample size is statistically relevant, an estimate of the carbon footprint of customer travel can be calculated. Zip code data can be valuable in tracking customers’ and employees’ points of origin. Stores can then overlay existing transportation options to see where new solutions are needed or, if solutions are in place, to communicate them more effectively. Customer surveys will not provide insights about potential customers who are unable or unwilling to access the store; additional broad market research will be needed for that purpose.

Analyze opportunities.

With the emerging picture of the current situation, the project team can now analyze the needs and possibilities for sustainable customer transportation. One method to use is the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. As ideas for potential strategies develop, it may be helpful to write a brief that communicates concepts to others and refocuses efforts when necessary.

In addition to addressing customer needs, consider opportunities to promote sustainable transportation for employees. While the carbon impact may be only a small percentage of the total for customer transportation, employees are effective ambassadors. Furthermore, retail employees often receive modest wages, so they appreciate more economical transportation options. Incentives for using sustainable transportation might include benefits and programs such as flexible spending accounts; tax savings; monetary rewards; and internal contests with gift cards, products, or money as prizes.

Estimate the carbon footprint.

When efforts are under way to reduce a company's overall carbon footprint, calculating the impact of customer transportation can be enlightening. IKEA estimates that its customer travel carbon footprint was nearly three times greater than the carbon footprint of all its stores and offices. As a sustainable customer transportation program is implemented, measuring the reduction in carbon emissions can be a credible way to measure progress.

A basic customer transportation footprint is calculated in this way:

$$\begin{aligned} & \text{Number of customers traveling by private vehicle} \\ & \times \text{average distance traveled} \\ & \times \text{average fuel economy} \\ & \times \text{emission factor} \end{aligned}$$

For a rough calculation, use estimates of the number of customers traveling by private vehicle and the distance traveled. A store manager may be able to approximate this information. For a more precise estimate, gather zip code data from customers and/or survey them on how they got to the store (for example, mode, vehicle fuel efficiency, and distance). More advanced carbon analysis can include carbon footprints of mass transit, e-commerce, home delivery, and other relevant emissions. Average fuel economy and emission factors can be found in national or regional databases. The World Resources Institute's Greenhouse Gas Protocol Initiative provides a useful tool for simple or more advanced transport emissions calculations. According to that tool, an average carbon footprint for 100,000 miles driven by passenger cars in the United States, model years 2005 to the present, is 39.43 metric tonnes CO₂-equivalent.⁸ As noted earlier in this guide, when a customer makes more than one stop on a shopping trip, the carbon emissions attributed to a particular store are reduced. Trip information can also be collected from customer surveys. Advanced analysis can also use emissions factors that include lifecycle impacts of vehicles, fuels, and infrastructure (appendix B).

Step 2: Pilot Projects

Running pilot projects at selected locations can be a good way to assess opportunities and test implementation strategies before a wider rollout. An internal project team should manage these projects, which will inform the development of a corporate-wide strategy.

Design the pilots and select stores.

Pilot stores should implement one or more sustainable customer transportation strategies. Some things to consider in the design and selection of these stores are:

- Location (such as geography, demographics, distance to customers, and other factors)
- Current transportation situation and opportunities
- Capacity to implement, monitor, and communicate pilot test results

⁸ World Resources Institute, GHG Protocol Tool for Mobile Combustion, version 2.3 (2008), www.ghgprotocol.org/calculation-tools/all-tools.

Consider how the pilot stores' successes and challenges in addressing customer transportation could (1) inform a broader corporate strategy, and (2) build the business case for that strategy internally. For these two objectives, consider whether to include stores that represent the "average" or stores that are diverse, or even at the extreme, on criteria such as sales, geography, or demographics. Think about whether to include "easy win" stores where success is almost assured or "challenging" stores where success is not guaranteed, but if a strategy can be successful there it can work anywhere. The IKEA pilot test focused on nine stores in three countries, more or less covering the extremes and the middle of each market.

To measure success, agree on key performance indicators (KPIs) that include both environmental and business benefits. Here are a few examples:

- **Transport carbon emissions** (see page 31) based on reasonable estimates and improved with zip code data and customer survey information
- **Basic sales data** (including home shopping revenue) to show changes in sales, and data from customer surveys to show increased sales from new customers
- **Customer perceptions** of the shopping experience and the company's sustainability performance
- **Average time to find parking**, drawn from customer surveys or periodic studies of parking lots
- **Percentage of customers using mass transit or other fuel-efficient alternatives**, drawn from customer surveys or periodic studies of mass transit stop or station usage
- **Home delivery emissions per delivery**, measured and calculated by delivery vehicles, based on fuel usage, vehicle fuel efficiency, and number of deliveries
- **Employee use of incentives for sustainable transportation**, such as carpooling and flexible spending accounts.
- **Resources required**, including investments, expenses, and employee time, tracked by the finance department and/or the project manager

As far as is practical, consider and account for external factors, such as seasonality, that may influence these indicators. Assess the KPIs at the beginning of each pilot project to create a baseline for measuring project success.

Implement test strategies.

Identify a responsible person in each pilot store, and secure commitment from store management. An implementation plan for the sustainable customer transportation strategies should include relevant tasks and actions, responsible parties, and a timeline. The time period should be sufficient to raise awareness with target consumers and to enable the stores to measure results that will guide decisions about a wider project rollout. Include time to meet with local municipalities and external resources that might be able to support changes over the long term.

Record steps taken and identify support needed.

As the pilot project begins, each store should document execution of the implementation plan and adjust it along the way. Sometimes unanticipated actions or inputs are required, or a better way of doing something is discovered. Capturing the lessons learned in the pilot project will facilitate the broad rollout.

All communication materials, calculation tools, documentation for municipalities, and other supporting information should be part of the project documentation.

Monitor and communicate results.

The key performance indicators are the basis of project monitoring. Other unexpected indicators of project success may emerge and can be included. Calculate return on investment in terms of increased sales, emissions reductions achieved, or other indicators. Customer anecdotes, photographs, videos, and data tables will all contribute to communications. The project results should be shared internally to inform management and begin to engage all stores on the concept of sustainable customer transportation.

Step 3: Strategy Development and Implementation

The pilot project experience will give a company a good sense of the opportunities for improving customer transportation sustainability and the requirements for implementing the improvements at the store level. The next step is to develop a corporate-wide strategy for the implementation of sustainable customer transportation.

Determine a corporate strategy.

If the pilot projects tested many different strategies, some effort may be required to prioritize activities, based on the environmental and business impacts achieved compared to the resources required for implementation. Like the pilot tests, the corporate strategy should base its goal on achieving the desired measurable and time-bound impacts. The strategy may include specific actions that all store locations should take and/or targets with flexibility given to each store on how to reach them. (For a sample strategy analysis table, [see appendix C.](#))

Develop guidance tools.

Whether a company decides to prescribe specific actions stores should take or lets each store choose its own way to reach the carbon emissions target, some guidance tools will be helpful. IKEA stores received the following guidance documents:

- **Store Self-Assessment Survey** ([appendix D](#))—A self-assessment tool with questions designed for stores to assess their current people transport situation and to provide ideas and tips for additional actions stores could take.
- **Planning and Implementation Toolkit** ([appendix E](#))—A complete guide for stores to plan and implement sustainable customer transport projects. Project planning checklists, guidance documents, and communication templates are included.
- **People Transport Carbon Emissions Model** ([appendix F](#))—A spreadsheet-based model that provides the carbon footprint of customer transportation for individual stores. It also allows stores to see the carbon impact of changes in the way customers travel, which can help with planning and prioritizing sustainable transport activities. Data inputs to the model include distance and mode of customer travel (from customer surveys); home delivery and long-haul truck efficiency and distances; in-store and home shopping sales; and average vehicle efficiencies, by country.
- **Mass Transit Evaluation Model** ([appendix G](#))—A spreadsheet-based model to evaluate potential improvements in public transit use. Today’s automobile and

public transit costs to shoppers are first determined and then compared against the improvement scenario's public transit costs. Also included is a model aimed to assist with siting new store locations.

- **External Outreach Guide for Municipalities and Other Partners** ([appendix H](#))—A guidance document for project leaders of sustainable customer transportation and expansion projects when meeting local authorities or other companies. Examples include requesting additional mass transit service to a store from local authorities or working with private vendors to provide shuttle service to a store.

Attain buy-in from stores and management.

A successful strategy is anchored in the goals and working plans of affected groups like store management, property/real estate, and communications. The following measures can help ensure buy-in:

- Involvement of key people in the project team, steering group, and meetings
- Communications that highlight measured impacts and benefits of the pilot projects and include photographs and videos
- Clear guidance on next steps and tools for stores to plan and implement sustainable customer transportation activities

Monitor progress and share experiences.

To ensure progress toward carbon reduction targets, the impacted divisions should develop and implement a monitoring and evaluation system. Store-level carbon emissions inventories serve as immediate feedback and can be expanded to global targets. In addition, tracking business-related key performance indicators will strengthen the case for store managers to continue investing in sustainable customer transportation activities. Disseminate good implementation examples to other stores for inspiration and guidance.

A company can demonstrate leadership and increase impact by engaging externally on sustainable customer transportation issues. This engagement can include encouraging other retailers to implement sustainable customer transportation initiatives. It can also include external partners that can help companies realize carbon reduction targets, such as hybrid bus and delivery truck operators, car-share programs, citizen groups, and municipal governments. Companies that produce low-carbon technologies may be interested in innovative partnerships, such as providing hybrid buses to stores or assisting with store transit planning.

Case Study



CASE STUDY IKEA Brooklyn: Safe, Smooth, and Sustainable Transit

In spring 2002, IKEA identified a site in the community of Red Hook in Brooklyn, New York, as the location for a future store. However, the site was not near a major highway or close to public transit. So, as part of IKEA's external and internal approval processes, the new store needed a plan for managing large numbers of vehicles on narrow city streets. Nine years later, the store's success is testimony to thoughtful planning and implementation of a sustainable customer transportation strategy that works for IKEA and for the community.

IKEA's first step was to hire a traffic engineer to conduct a comprehensive analysis of the surrounding streets and streets further away that could affect customer flow to the store. This formal traffic study evaluated key intersections, traffic patterns, signal timings, and other issues. There were many meetings with community leaders, neighbors, local officials, and the city's department of transportation and transit agency to assess concerns like safety, sightlines, and signage needs.

This outreach provided local perspectives on the functional and political issues that needed to be addressed. It was clear that offering shoppers a variety of transit options was the only solution to managing flow and assuring residents of minimal impact on the community.

The transit approach for IKEA Brooklyn featured these elements:

- Extending the local bus routes to reach and stop at IKEA Brooklyn
- Shuttling riders to the store from several nearby subway stations
- Providing water taxi service from lower Manhattan to IKEA Brooklyn, with cost credited to purchase
- Ensuring enough on-site parking spaces
- Installing bike racks
- Adding wayfinding signage along expressways and streets
- Providing reserved parking for car-sharing vehicles or fuel-efficient cars

With the cooperation and support of city agencies, elected officials, and community leaders, this traffic plan was a key component of the IKEA development approved by the New York City Council in October 2004.

While construction was under way for the store and the infrastructure improvements in 2006 and 2007, IKEA finalized arrangements with service providers for the privately owned water taxi and shuttle bus services. In close collaboration with the New York City Transit Authority, new bus stops were designed and built on IKEA property, right in front of the store.

In preparation for the store opening in June 2008, managers implemented several other key operational initiatives. The opening communications campaign identified the available transit options. On the store website, there was not just a listing of the options but also a completely separate tab titled “How to Get to IKEA Brooklyn,” with maps, routes, schedules, and even an interactive area where customers could get directions from their address to the store. To accommodate the numerous shoppers arriving at IKEA by means other than cars, the store augmented its home delivery service with a courier service for smaller items that could fit in a three-cubic-foot box for delivery to a customer’s home. This added benefit allows customers to shop without the need for a private vehicle for the return trip home.

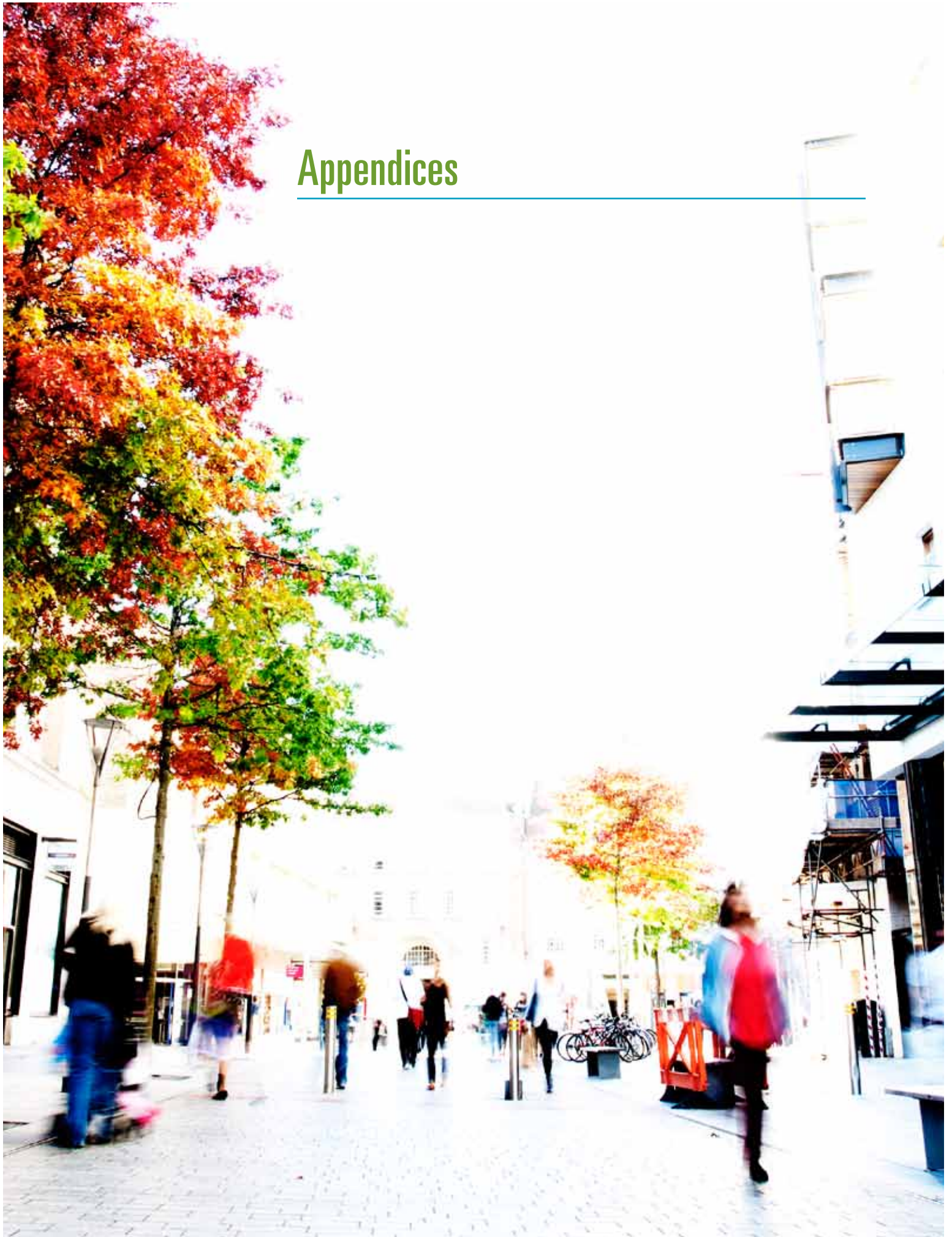
As promised, IKEA conducted a follow-up traffic study a year after the store opened to assess the effectiveness of the infrastructure improvements and transit options. The findings were impressive and well received:

- The increase in vehicle traffic from the IKEA store has caused no undue delays at neighborhood intersections.
- Traffic mitigation strategies and traffic-calming methods implemented by IKEA are improving safety for all drivers and pedestrians in the area.
- More customers than the original traffic study projected are using alternative transportation modes to arrive at the store.

The numbers are impressive. IKEA Brooklyn has facilitated a system in which 29 percent of the store’s weekday visitors take alternate means of transportation, compared to projections of 10 percent. One weekend, use of sustainable transit rose to 50 percent, double the projection. For many in the Red Hook community and New York City, and within IKEA U.S., IKEA Brooklyn’s sustainable transportation effort is viewed as a remarkable accomplishment.



Appendices



Appendix A. Store Survey, IKEA Sustainable Transport of People Project

IKEA used this questionnaire to survey current activities by IKEA stores to promote Sustainable Transport of People.

1. Store name, city, and country _____
2. Which best describes the location of your store?
 - a. City center
 - b. City outskirts/suburb
 - c. Rural area
3. Is your store in a shopping center?
 - a. Yes
 - b. No
 - c. No, but other stores are in easy walking distance
4. How easily can customers take public transportation to your store?
 - a. Very easily (good public transportation options come to the store)
 - b. Somewhat easily (public transportation options exist, but are somewhat inconvenient due to location, route, or time to reach store)
 - c. Impossible or very inconvenient
5. Can customers ride an IKEA shuttle bus, ferry, or other vehicle to your store? This can include private vehicles shared by other local businesses.
 - a. Yes, every day
 - b. Yes, but not every day (e.g., only weekends or weekdays)
 - c. Only on special occasions
 - d. No
6. How accessible is your store by foot or bike?
 - a. Very accessible (good walking or biking access to the store)
 - b. Somewhat accessible (walking or biking access exists, but is somewhat inconvenient due to location, route, or time to reach store)
 - c. Not accessible, very inconvenient, or unsafe

Appendix A. (continued)

7. Does your store offer discounts/incentives to customers who take alternative transportation?
 - a. Yes, home delivery discount
 - b. Yes, discount on products
 - c. Yes, reimburse public transit expense
 - d. Yes, other discount/incentive
 - e. No

8. Please mark which of the following items or activities you currently have at your store (check all that apply):
 - a. Reserved parking for low-emission vehicles
 - b. Electric car charging station for customers
 - c. Promotion of car-sharing or carpooling to customers
 - d. Directions for alternative transportation to the store on information board in the store
 - e. Directions for alternative transportation to the store on store website or in advertisements
 - f. Ability to measure which transportation mode customers take to the store

9. Are there additional alternative transportation options or incentives available to coworkers that are not captured in the answers above for customers?
 - a. Yes, alternative transportation incentives for coworkers (e.g., carpooling programs, public transportation discounts)
 - b. Yes, shuttles or other alternative transportation for coworkers
 - c. No, the same options apply for customers and coworkers

Appendix B. Life-Cycle vs. Tailpipe Carbon Emissions⁹

Transportation decision making often focuses on reductions to vehicle miles of travel. While this approach can be effective, it does not acknowledge the myriad products, processes, and services that must exist to move the vehicle. Life-cycle assessment (LCA) is a methodology for capturing supply chains and the interdependencies of processes. LCA acknowledges that few processes exist without the support of other infrastructure, and proper greenhouse gas valuation should capture these effects.

Research suggests that a nontrivial fraction of a transportation mode's greenhouse gas emissions are found in the many vehicle (e.g., car manufacturing, train maintenance), infrastructure (e.g., roadway construction, train station lighting), and fuel (processing and distribution) components required for a mode to operate. For every 100 energy units of diesel or gasoline fuel, an additional 16 energy units are needed in these processes. Therefore, if a company reduces 100 energy units of car travel in direct operation, an additional credit of 16 energy units should be received due to additional life-cycle reductions (carbon is commensurate). Reducing vehicle miles traveled by a car also delays the manufacturing of a new vehicle so that fewer vehicles will need to be manufactured. This benefit adds approximately 10 percent additional carbon reductions relative to tailpipe emissions.

LCA factors from peer-reviewed studies and tailpipe emissions factors for various forms of on-road and rail transportation can be used for carbon modeling in this project. When implementing LCA factors for transportation modes, it is important to acknowledge that strategies to reduce greenhouse gas-intense modes have additional benefits that would help a company to reach reduction goals. By acknowledging the life cycle, vehicle miles reductions produce greater savings than if only the tailpipe is considered. In addition, the company will be acknowledging that processes are not independent in their operations and that a change in one component will have indirect effects elsewhere.

⁹ Adapted from "Life-Cycle Assessment and IKEA's Sustainable Transport of People," project report, Mikhail Chester, consultant, March 30, 2010.

Appendix C. Strategy Analysis

Strategy	Description	Emissions Reduction Impact	Complexity to Implement	Ability to Influence Changes	Department to Lead Strategy Adoption
Home Shopping	50 percent of new customer sales growth comes from home shopping channel from 2010 to 2015	High	Complex	High	Home shopping
Multiple Stops Per Trip	20 percent of customers make an additional stop on their shopping trips (avoiding an extra trip)	High	Complex	Low	Shopping center companies, retail management, communications
Smarter Shopping	10 percent of store customers purchase twice as much per trip due to improved online product information	High	Simple	Low	Home shopping, customer relations
Store Location	5 percent reduction in average customer distance to store	High	Complex	High	Property, retail management
Mass Transit + Home Delivery	5 percent of store customers switch from private car to mass transit with improved home delivery	Medium	Medium	Medium	Retail management, customer relations, property
Improve Long Haul	10 percent reduction in long-haul emissions per cube	Medium	Simple	High	Transport
Fuel-Efficient Cars	5 percent of private car trips shift to fuel-efficient vehicles	Low	Simple	Low	Retail management, customer relations
Reduce Private Trucks	25 percent of private truck trips shift to private vehicles; each shifted trip includes improved home delivery	Low	Simple	Low	Customer relations
Improve Home Delivery	10 percent efficiency improvement for home delivery	Low	Simple	Low	Retail logistics
Climate Positive Actions	Engage other retailers to promote sustainable customer transport; influence everyday transportation choices of customers	High	Complex	Medium	Sustainability group, customer relations

KEY:

■	Favorable
■	Less Favorable
■	Unfavorable

Strategies for reducing greenhouse gas emissions from people transportation will vary from one company to another. The table above is a sample analysis of various strategies and their potential impact. The strategies are ranked according to potential impact, complexity to implement, and the company's ability to influence achievement of the strategy. It also recommends departments to lead strategy implementation. These strategies and analysis would vary depending on the company.

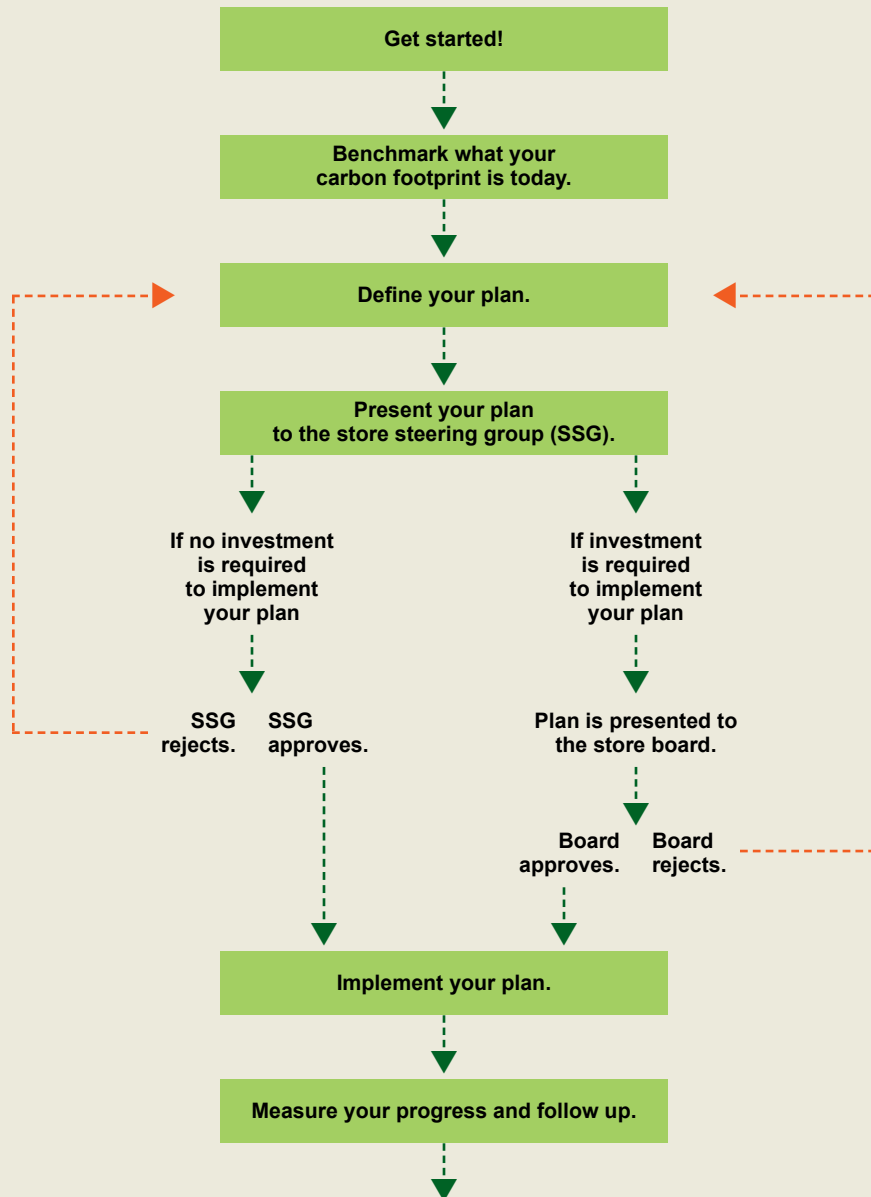
Appendix D. Store Self-Assessment Survey

IKEA developed a survey so that store personnel could take a tour of their location and determine which solutions were implemented and which would provide additional opportunities to reduce carbon emissions. The solutions should be appealing and easy for customers and coworkers to use. Questions covered the following categories:

- Parking
 - Fuel-efficient car parking
 - Car-share parking
 - Carpool parking
 - Vanpool parking
 - No idling in loading zone (policy and signage)
- Bus
 - Bus stop and connectivity/convenience of bus lines
 - Bus shelter (safety and comfort)
- Biking
 - Biking amenities, including safe access routes
 - Bike-locking facility
- Shuttle
- Train
- Walking
- Incentive programs for customers and coworkers
- Communications, including store website, external media, and coworker communications

Appendix E. Planning and Implementation Toolkit

Developed by IKEA, this chart provides an overview of the process IKEA stores should take to implement Sustainable Transport of People programs at their locations. The types of guidance supporting each step in the process chart are outlined below.



Appendix E. (continued)

Get started.

- Determine who is responsible for the project in your store.
- The responsible staff member connects with the store team to determine everyone's role in the project.
- Review the online toolkit.
- Create a project timeline.

Benchmark what your footprint is today.

- Complete local assessments.
 - Location audit
 - Coworker survey
- Use the IKEA People Transport Carbon Emission Model to measure your location's carbon emissions.
 - Consult with a Sustainability Manager if support is needed.

Define your plan to reduce your footprint.

- Review additional location-specific tools, including the provided zip code map and your customer survey results.
- Review the "How to Work with Your Local Government" document.
- Complete the Sustainable Transport of People Action Plan using the template provided.
- Present the plan to your store steering group for approval.
 - If no or only a very small investment is required: The store steering group can approve the proposal and the store can begin implementation.
 - If investment is required: The team needs to present a proposal to the store board.

Implement actions that drive a decrease in carbon emissions.

- Begin implementing actions according to your plan.
- Document your actions using the provided template.
- Create and implement a supporting communication plan, creating awareness with coworkers and customers. Share your good examples with the Sustainability Manager.

Measure, provide feedback, and follow up.

- Continue to track results and progress annually on:
 - IKEA People Transport Carbon Emissions Model
 - Customer survey for customer transport
 - Coworker survey for coworker transport
 - Zip code map
- Provide feedback and good examples to Sustainability Manager
 - Take before-and-after photos

Appendix F. People Transport Carbon Emissions Model

Input	2009	Scenario 1 2009 Data	Scenario 2 2020 Technology Estimate	Benchmark
Annual number of purchases (total)	1,300,000	1,300,000	1,300,000	Northern EU
Annual store purchases (included in total above)	1,260,801	1,260,801	1,130,801	
Annual home shopping purchases (included in total above)	39,199	39,199	169,199	
Annual sales (Euro)	€ 100,000	€ 100,000	€ 100,000	
Annual number of home deliveries	275,000	300,000	325,000	
Private vehicle (car/truck)	84%	74%	64%	84%
Efficient private Vehicle (hybrid/electric)	0%	5%	0%	0%
Alternate transit (bus/train/IKEA shuttle/bike/foot, etc.)	13%	18%	23%	15%
Home shopping	3%	3%	13%	1%
Total store emissions (metric ton CO₂/year)	27,188	26,344	22,623	13,866
Total emissions/volume (kg CO₂/m³)	197,1	187,3	146,5	164,0
Petrol (gasoline) equivalent (million liters per year)	10,6 M liters	10,2 M liters	8,7 M liters	

KEY:

 Pre-populated Data
 User Input Data
 Calculated Results

This table shows the interface of the People Transport Carbon Emissions Model for a fictional store, with pre-populated store data and calculated carbon emissions (in blue), and user input scenarios (in yellow). This spreadsheet-based model provides the carbon footprint of customer transportation for individual stores. It also allows stores to see the carbon impact of changes in the way customers travel, which can help with planning and prioritizing sustainable transport activities. Data inputs to the model include distance and mode of customer travel (from customer surveys); home delivery and long-haul truck efficiency and distances; in-store and home shopping sales; and average vehicle efficiencies, by country.

Appendix G. Mass Transit Evaluation Model¹⁰

Time and Cost Factors

Time

- In-vehicle time
- Transit access time
- Transit frequency
- Income

Costs

- Fuel
- Ownership/
maintenance
- Transit tickets
- Parking
- Tolls

Household

- Auto ownership rates
- Home location
(transit access time)

Transit

- Population density
- Convenience
- Comfort
- Safety
- Performance
(frequency)

Improving mass transit solutions can be a good investment for companies, especially if the result is more customers going to the store. To evaluate possibilities for increasing mass transit use for a given store location, factors that affect mass transit usage were identified through a literature survey. Several studies were examined for this project in the fields of mode choice theory, shopping choice, transit-oriented development, and home shopping. In evaluating mass transit options for stores, these factors can provide insight on why shoppers choose the modes they do and what can be changed to shift their choices toward mass transit.

Time and cost were found to be the most important factors in a traveler's choice of one mode of transportation over another. The time and cost factors manifest in several different forms. Time trade-offs are impacted by the trip taker's income and transit frequency. In general, the higher the income, the lower the tolerance for transport modes that have longer travel times. And the frequency of transit determines how long the passenger will have to wait, thus increasing the indirect trip cost.

For automobile drivers, trip costs typically appear as fuel, ownership/maintenance, tickets, parking, and tolls. The choice to use an automobile is based largely on auto accessibility, which is mostly captured in ownership rates. The home location has direct implications for transit access time and therefore the likelihood of choosing automobiles.

In evaluating the likelihood of shoppers using existing transit systems, population density, transit quality, and system performance factors can be considered. Population density plays a role in determining the customer base that may exist for a transit system. Convenience, comfort, and safety appear to be important considerations for transit system trip takers. Convenience, which may manifest as frequency of service, has effects on total trip time. Comfort is important, and safety appears to be a significant concern for many travelers. Finally, performance of the system, which again can be measured by interconnectedness and frequency, is also important.

Understanding these factors can help store management and expansion teams evaluate strategies to increase the number of customers taking mass transit to existing stores and new store locations. Where connection to public transit is not feasible, these same considerations can be used to examine whether a company might offer its customers a private mass transit option such as a shuttle bus from the nearest transit link or city center.

¹⁰ Adapted from "Mass Transit Mode Choice Literature Survey and IKEA's Sustainable Transport of People," project report, Mikhail Chester, consultant, April 29, 2010.

Appendix H. External Outreach Guide for Municipalities and Other Partners

To help stores improve accessibility by reaching out to public officials and private partners, a company can answer the following questions.

- What internal resources are available to support the store's efforts?
- Who should a store contact (for example, municipalities, regional governments, local transit authorities, private landowners, other businesses, and sustainability-focused organizations)?
- What value would a transportation solution project bring to each partner?
- When should a store approach a municipality or relevant governmental entity?
- What should a store ask of a municipality?
- What could a municipality ask of a store?
- How can stores provide incentives to coworkers and customers?
- What regional and local laws and regulations require compliance?
- What company messages should we mention or reinforce?

After a company has answered these questions in its outreach guide, it should provide case studies and a summary.

