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Making Sustainability Mainstream: The 5A Planning Approach and the Rogers Innovation Adoption Curve

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Sustainability is a familiar concept among planners and our communities. Many communities have developed some iteration of a sustainability plan, climate action plan, resilience plan, or similar initiatives. But while some of these strategies and plans have led to more sustainable outcomes, others have not been effective in bringing change. Why is this the case?

A sustainable society is built on sustainable behaviors, (Figure 1), but today's public policies, services, and built environment designs make those behaviors unnecessarily difficult to foster. To gain broad adoption of sustainable practices, we need a new paradigm that makes such practices easier and more attractive than the status quo. This requires two elements: first, a framework for designing the built environment and its services in ways that make sustainable behaviors and lifestyles the norm, and second, a better understanding of how widespread adoption occurs to accelerate society's movement in that direction. The 5A planning approach and the Rogers innovation adoption curve are two concepts planners can use to move towards a new sustainability paradigm.

The 5A planning approach outlines five key elements that drive our decision-making as individuals—availability, affordability, attractiveness, awareness, and accessibility—and explains how they can be used to understand unsustainable behaviors and determine what is needed to change them through planning and design. The Rogers innovation adoption curve is a model that divides consumers into five major groups based on their adoption behavior—innovators, early adopters, early majority, late majority, and laggards—to understand how new ideas, practices, or products spread through a population. Together they offer planners a focused approach to designing and implementing effective sustainability efforts that drive lasting community change.

This *PAS Memo* explains why current sustainability measures are often unsuccessful and describes how applying the 5A approach together with the Rogers curve can result in sustainability plans that create truly sustainable outcomes.

Our Current Approach to Sustainability

Some of our challenges in moving towards sustainability start with difficulties in clearly defining such a broad, global concept. This *Memo* offers the following definition of sustainability for planning practice:



Figure 1. Successful sustainability city planning requires a new paradigm that makes it easier to promote sustainable behaviors and make them mainstream (Olivier DJIANN/iStock Editorial/Getty Images Plus)

The capability for an urban environment to operate in a way that ensures the long-term health of the planet, fosters economic growth and development without depleting natural resources, and promotes a fair and inclusive society where all residents have access to basic needs and opportunities.

The goal of sustainability is to create cities that are not only thriving today but are also resilient and adaptable for future generations so that they may thrive as much, or more, tomorrow.

The principal way that planners can achieve this is through the design and refinement of our cities and their services. For over a hundred years, the profession has sought to do this through ideas such as Clarence Perry's neighborhood unit and Ebenezer Howard's garden cities, the later concepts of eco-cities and [smart cities](#) (Hurtado, Hitchings, and Rouse 2021), and the [15-minute city](#) concept popularized by the urbanist Carlos Moreno in recent years (Simon 2023). But these concepts are ideals; it is difficult for reality to match a model. Planners actively strive to get closer by emulating the best of what they observe in the profession. Yet, this focus on emulating best techniques can cause us to lose sight of key elements that make sustainability possible and actively practiced.

If You Build It, They Will Come—Or Not

Plans serve as strategic frameworks or roadmaps toward predefined future objectives. Many plans provide strategies and action items toward a more sustainable future for a specific community. But even with the diligent execution of all outlined strategies and actions, sustainable outcomes are not always assured. Even the most ardent supporters of sustainability projects recognize an area of continued uncertainty: if they build it, will people come?

For instance, for decades, the City of Chicago has pursued climate action plans, sustainability initiatives, and various measures aimed at reducing greenhouse gas emissions. The city provides the second-largest public transit system in the United States, has built over 400 miles of bike lanes (Chicago n.d.), and has repeatedly been named the "greenest city in the U.S." (RE Journals 2018). Yet, in 2019 almost 50 percent of the population within the city was driving to work instead of using sustainable means of transportation, such as public transit, walking, or biking, and in the Chicago metro region, over 70 percent commuted by car (Greenfield 2019). In contrast, Vienna, Austria, demonstrated significantly higher rates of sustainable transportation usage, with 25 percent opting for personal vehicles while over 75 percent used public transit, walked, or biked in 2019 (Mobilitätsagentur Wien GmbH 2019). This prompts the question:

Why do residents in some cities exhibit more sustainable behaviors than those in others, even when all these cities prioritize sustainability in their plans and provide the necessary infrastructure?

Evidently, the mere provision of infrastructure for sustainable transportation and energy-efficient building designs does not guarantee enhanced sustainability. Usage patterns and energy consumption are intricately linked to individuals' preferences, needs, and behaviors. Achieving successful outcomes necessitates not only the formulation and implementation of effective plans but also a nuanced understanding of individual behaviors and preferences (Stieninger Hurtado 2018).

Planning for sustainability requires more than simply designing sustainable infrastructure systems or buildings. Merely focusing on the symptoms of the problem without considering its root causes will result in outcomes that only address the technical aspect but not the socioeconomic aspect of the problem (Stieninger Hurtado 2018). To change unsustainable behaviors and habits, it is crucial to understand individuals' preferences and needs.

Current Barriers to Sustainability

To be successful, the systems and services of a sustainable city must offer unique, compelling, and holistic advantages that allow people to leave the comfort and familiarity of their existing habits, which are based on their underlying preferences. This requires a holistic perspective of the system, encompassing the root causes behind existing unsustainable habits and lifestyles and an understanding of what people need to be successful in their lives. Planners and designers must be aware of two primary challenges in planning for sustainable outcomes: a lack of systems thinking and a lack of consumer focus.

Lack of Systems Thinking

Sustainability plans or projects aim to establish sustainable alternatives to existing unsustainable practices. However, typical planning practice often lacks the necessary systems thinking that enables us to think holistically across various levels and scopes.

For example, in a typical approach, planners might identify excessive traffic congestion between point A and point B as a problem in and of itself that needs solving, and they might identify building a subway line between those points to be a solution that will reduce car traffic. But this approach fails to formally identify the underlying root causes of this problem. What prompts individuals to opt for driving between A and B? What disparities exist between A and B that contribute to this choice? What is in B that doesn't exist in A? And so on. Rather than develop a deeper understanding of the factors that might be underlying the congestion, we simply identify the congestion as a problem and then develop a response (i.e., build a subway line here) without any further exploration into the behaviors, incentives, and disincentives that create the issue to begin with.

Furthermore, this solution requires individuals to seamlessly transition from driving to taking the subway, yet this approach considers the sustainable alternative as if it were a commodity—or a monopoly—that has no competing

alternatives. Transit services are frequently designed with quality defined relative to that service rather than across the wide range of transportation options available. An amenity on the subway may thus be something “nice for the subway” rather than an incentive to choose the subway over any other mode of transportation.

Current approaches don’t recognize that sustainable options must effectively compete against unsustainable options to draw people’s investment and usage. The only way to do so is to create some form of advantage. The only way to achieve an advantage is to provide something more valuable—in this case, something that makes transit more valuable than all other forms of transportation.

Lack of Consumer Focus

The typical demand analysis for sustainability projects, such as a new transit service or bike lane, is built on economic forecasts. These forecasts center on the idea of a *rational actor*—someone who regularly pursues their highest economic interests according to available options, prices, and other measurable factors of intrinsic value. This approach seeks to establish a value proposition in which the measurable benefits of a service outweigh its measurable costs, allowing predictions about service adoption when benefits exceed costs. Insights into price elasticity and the dynamics between cost, ridership, and expected returns are valuable outputs of this model. Likewise, typical demand analysis rests on the age-old concept of *ceteris paribus* (“all else being equal”) assuming high ridership if transit is sufficiently affordable, despite the complex realities of individual decision-making that may be affected by factors outside of transit fare prices (e.g., weather, convenience, or perceived overcrowding).

However, these analyses rest on significant assumptions and, more notably, exclude hard-to-quantify factors such as personal preferences. In other words, there is no single rational actor who simply uses a service or product. Rather, we are all *consumers* who make everyday decisions based on likes, dislikes, values, culture, upbringing, past experiences, abilities, and a wide range of other factors. The typical demand analysis fails to recognize this—as do planners. It should come as no surprise that such models often fall short in accurately predicting consumer behavior under varying conditions—and that the best-laid plans for sustainability solutions don’t always deliver their expected outcomes.

A paradigm shift is needed. Practitioners must develop approaches that go beyond the idea of meeting some threshold in a typical demand analysis. Instead, we need to see community members as consumers who are always “shopping” for the options that meet their preferences as well as their needs. To more effectively plan for sustainability, planners should focus on how to understand, serve, and cultivate consumer demand for sustainable options at ever-increasing levels. The 5A approach and the Rogers curve offer a methodology to help them do just that.

From a Sustainability Plan to a Sustainable Community

Clearly, sustainability plans and designs must prioritize individual preferences and needs to create behavioral change. The 5A planning approach is a framework that can help planners achieve these aims by transitioning sustainability from a limited user base to mainstream acceptance. Planners must apply this approach in a way that addresses the diversity of needs, however, to ensure sustainable outcomes for all community members. One effective way to recognize a community’s diversity is to look at their individual preferences as consumers; indeed, our preferences create an inclusive umbrella that bridges all sorts of demographic differences. The Rogers innovation adoption curve takes this further by showing how many people in our communities have common ground in what they value most within the 5A approach. It also indicates the steps planners can take to develop those understandings and turn them into action.

The 5A Planning Approach: Focusing on Individuals’ Needs

When developing sustainability plans and strategies for a city or community, it is imperative to prioritize the well-being of its residents. And planners must acknowledge that these individuals are simply trying to lead their everyday lives. Most people do not prioritize sustainability solely for its own sake, nor do they engage in unsustainable practices with the intention of producing more greenhouse gases. Instead, they simply want to get things done and live enjoyable, fulfilling lives (Stieninger 2013).

Furthermore, as noted above, human decision-making processes are not necessarily driven by rationality. As explained by Nobel Prize-winning economist Richard Thaler, most decisions are based on emotions, which makes it even more difficult and complex to assess and understand the rationale behind people’s actions (Thaler and Sunstein 2008). This leads to the central question:

What factors can drive behavioral changes that lead to more sustainable outcomes, such as reduced greenhouse gas emissions from sustainable practices, while still allowing individuals to pursue their desired lifestyles?

Identifying and incorporating those factors into sustainability planning efforts will result in more successful outcomes.

The 5A planning approach was first developed in 2013 to change behavior toward energy efficiency through planning (Stieninger 2013) and was later expanded to address sustainable behavior in general (Stieninger Hurtado 2018). Extensive research conducted in the United States and Europe identified five critical factors that play pivotal roles in determining the success or failure of sustainability projects or plans: availability, attractiveness, affordability, accessibility, and awareness (Table 1).

Table 1. The Five “A”s

Factor	Definition	Examples of How to Encourage Sustainable Behavior	Examples of How to Discourage Unsustainable Behavior
Availability	Sustainable options must be available. The availability of unsustainable options must be limited.	Walkable distance (a quarter mile) to at least one bus or train station from any point in the city.	Limited parking throughout the city.
Accessibility	Sustainable options must be physically and legally accessible. The accessibility of unsustainable options must be limited.	Public transit accessibility of any point in the city.	Growth boundaries regulated by law to minimize sprawl and optimize transit use.
Attractiveness	Sustainable options must be attractive in terms of beauty, comfort, safety, and quality. Unsustainable options must be less attractive than sustainable options.	Bus/train frequencies less than five minutes during the day; lighting in stations and pedestrian areas for safety; pedestrian areas and shared streets; traffic light timing in favor of buses.	Traffic calming measures such as road diets, reduced speed limits, chicanes, and increased intersection densities; access management strategies such as reduced or prohibited curb cuts.
Affordability	Sustainable options must be affordable and less expensive than unsustainable options.	Inexpensive or free transit (e.g., through incorporation of price in property tax).	Road usage fees in cities and on highways.
Awareness	People must be aware of the availability, accessibility, attractiveness, and affordability of sustainable options, as well as the benefits of choosing them over unsustainable options.	Create awareness of sustainable option benefits by obvious design (e.g., visible subway stations), laws and regulations, and information and education (e.g., car-free days).	Create awareness of negative externalities of unsustainable options (e.g., air pollution, car crash data) and the negative effects of those choices.

Source: adapted from Stieninger Hurtado 2018

These five “A”s can be leveraged through both positive reinforcement, by adding something positive (incentives) that makes sustainable behavior an appealing and enjoyable choice (e.g., getting price discounts at the local bike store for every mile traveled by bike), and negative reinforcement, by removing something negative (barriers) that has been keeping people from opting for the sustainable choice (e.g., restricting car access in an area to make it safer to ride a bike or removing transit fees). In addition, awareness about the consequences of sustainable and unsustainable behavior is crucial. Unsustainable behavior must be associated with undesirable consequences to encourage a shift toward sustainable practices (Skinner 1971).

1. Availability. The availability of sustainable options is crucial, allowing people to change unsustainable behaviors such as driving by providing alternatives such as shorter and walkable distances between services, public transit, or bike lanes. In many cases, this is as far as sustainability actions go. Providing sustainable alternatives without changing what is already there, however, may not be enough incentive for change. Limiting the availability of unsustainable choices, like restricting parking in certain areas, can additionally encourage sustainable behavior.

2. Attractiveness. The success of sustainable options relies on their attractiveness compared to unsustainable choices. This includes factors such as beauty, service quality, safety, and comfort, which are all subjective. Design not only affects how people perceive things but also how they use them (Stieninger 2013). Hence, sustainable options need to be designed so that they enhance perceptions of safety, comfort, and service quality, among other factors, and therefore encourage behavior change, while unsustainable options need to be made less attractive.

3. Affordability. Behavior change towards sustainability requires sustainable options that are less expensive than unsustainable alternatives. This is already the case in some instances; for example, riding a bike is cheaper than driving a car. However, often this is not the case; for example, apartments in dense urban environments served by transit may be more expensive than single-family houses in the countryside that require driving (with the former being more sustainable than the latter). This disparity highlights market failures where unsustainable developments persist despite sustainability goals. To facilitate behavior change, affordability must be adjusted to align with sustainability objectives. This means pricing unsustainable options to reflect their true environmental costs.

4. Accessibility. Sustainable options must be physically and legally accessible, with urban design, available technologies and infrastructure systems, and laws and regulations playing crucial roles. Urban planning and regulations should prioritize sustainable choices over unsustainable ones. For example, single-family zoning facilitates unsustainable suburban sprawl, and highways enable access to these developments. Sustainable urban planning must promote the accessibility of sustainable options and discourage access to unsustainable ones. This shift in policies and approaches can facilitate the physical and legal accessibility of sustainable options and limit the accessibility of unsustainable options.

5. Awareness. Environmental knowledge alone does not drive environmental action; simply informing people about climate change isn't enough to change their behavior. Awareness of the benefits and advantages of sustainable options as well as the disadvantages of unsustainable options is key. People must understand that sustainable choices are more attractive, affordable, and accessible than unsustainable ones. This awareness, along with positive and negative reinforcement, can lead to behavioral change (Skinner 1971). Misconceptions and biases often influence decisions towards unsustainable options; for example, many are unaware of the cost-effectiveness of sustainable choices such as public transportation over driving. Increasing awareness of these factors is crucial for promoting sustainable behaviors.

These five As underscore the importance of focusing on people, understanding their self-interests and needs, and capturing their individual situational variables and psychological factors, alongside creating cities that encourage sustainable behavior while discouraging unsustainable practices (Stieninger 2013; Stieninger Hurtado 2018). People's decisions, which are shaped by preferences, self-interest, and needs, will determine the success or failure of a sustainability plan or project. The built environment must encourage sustainable choices by making them available, accessible, affordable, and attractive, and by creating awareness of their advantages over the unsustainable options. This can shift societal values, as emphasized by Enrique Peñalosa, former mayor of the City of Bogotá, Colombia: "A good city is not a city where poor people drive cars. A good city is a city where rich people take public transportation."

A crucial aspect of the 5A approach is that the five As cannot be implemented in isolation; they can only be successful if all five are considered and integrated. A holistic framework encompassing all five As, not just one or two, is indispensable. Additionally, it is worth re-emphasizing that applying the 5A approach requires encouraging sustainable behavior *and* discouraging unsustainable practices.

Sustainability for All

In public service design, traditional demand analysis often fails to capture the nuanced ingredients for success. While it may inform decisions on location and design, it cannot guarantee

the fulfillment of intended objectives. Lasting success hinges on an ongoing commitment to meeting the evolving needs and desires of the individuals in the community.

Ensuring that no one will be left behind is paramount in the successful implementation of the 5A approach. Because the five As are deeply rooted in personal preferences, their effective application demands an equity lens. Affordability, for instance, can have very different dimensions. While some people can afford to pay millions of dollars to go to the moon, others can't afford a two-dollar train ticket. Similarly, attractiveness is subjective, varying greatly among individuals based on their preferences, cultural identities, and environmental considerations.

The focus on continually delivering what residents truly desire that lies at the core of the 5A approach necessitates a shift towards a consumer-driven perspective in public service provision. Giving residents what they want requires having a clear knowledge of those things. It also requires having a results-oriented view for each project and program: determining what's in demand or what's needed (the roots of why people want something) and understanding the competing available options (the reasons for the traditional, unsustainable behavior).

To do this well means that the individuals of the community must be the center of the framework. This includes the diversity of 5A preferences that inhabit individual decision-making, the effort planners must take to recognize each preference as a reasonable demand for quality, and the manner in which planners must strive to find solutions that will fully satisfy as many different preferences as possible.

An environmentally conscious commuter who takes the subway shares common ground with the cost-conscious service worker who does the same. The two individuals might use transit for different reasons, but a successful public service provider will serve them both—and others—equally because both are crucial to achieving success. Because the most effective methods serve several disparate interests, inclusivity becomes essential for achieving efficiency. When the operational goal is to serve as many people as possible, discrimination, bias, and inequity become structurally disincentivized.

This goal—to continually deliver the things our residents want—lies at the heart of the 5A approach. Closely collaborating with the individuals of the community and leveraging community insights is essential to understanding the multifaceted dimensions of the five As beyond predefined demographics or socioeconomic categories and delivering on this goal. If such a goal is kept front and center in the public service world, it can create a different level of accountability for public providers. But, as suggested above, this approach requires a consumer-driven perspective.

The Rogers Curve: A Market Perspective on Individual Preferences

The 5A planning approach allows us to understand the common ground of popular demand. From a marketer's

perspective, we can see how the five As manifest in several distinct groups, or cohorts, that make up the market's demand based on each group's set of preferences.

Consider the concept of a sustainable city, in which the aim is for residents to access most, if not all, of their needs in a safe, comfortable, connected environment that does not force a person to rely on an automobile. This idea presupposes a universal desire for more convenient, sustainable, and enjoyable urban living.

It is safe to assume that every person prefers to have these benefits (i.e., convenience, sustainability); they simply differ in the intensity of their preferences. Regardless of demographic distinctions, some individuals highly value sustainable and efficient urban design and are willing to embrace changes that align with these values. On the other end of the spectrum are people who resist such concepts due to preferences for traditional suburban living and all the amenities that come with the costs. The mixture of preferences can lead individuals to act contrary to what might be considered their "rational" economic self-interest, either by actively supporting or opposing sustainable development as an abstract idea.

These divergent views are reminiscent of other consumer preferences, such as those seen in brand rivalries like Pepsi vs. Coke or sports team allegiances. Markets are essentially spectrums of these preferences, ranging from strong proponents to staunch opponents, with most people falling between these extremes. This spectrum can be segmented using the Rogers innovation adoption curve (Figure 2). This

concept, introduced in 1962 by American sociologist Everett Rogers, categorizes consumers into five groups based on their readiness to adopt innovations: innovators, early adopters, early majority, late majority, and laggards.

- **Innovators** and **early adopters** are the trailblazers and opinion leaders who often drive a conversation through their staunch advocacy and heartfelt values that align closely with the principle at hand. In the realm of sustainability, these groups often appeal to environmental or social needs. These groups are crucial for the initial acceptance and promotion of the practice. Innovators make up about three percent of the population, while early adopters comprise around 13 percent.
- However, many innovations that cater to these groups are different from what will cater to the preferences of the **early majority**—a much larger group whose adoption signifies mainstream acceptance. This group comprises about 34 percent of the population.
- The next group, known as the **late majority**, is the individuals who hold off on their engagement until the product or service has reached the mainstream (through the early majority) and has an overwhelming level of value. When sustainable development reaches this stage, it has become so convenient, popular, and/or affordable as to be inconvenient to not engage with the practice. This group also makes up about 34 percent of the population.

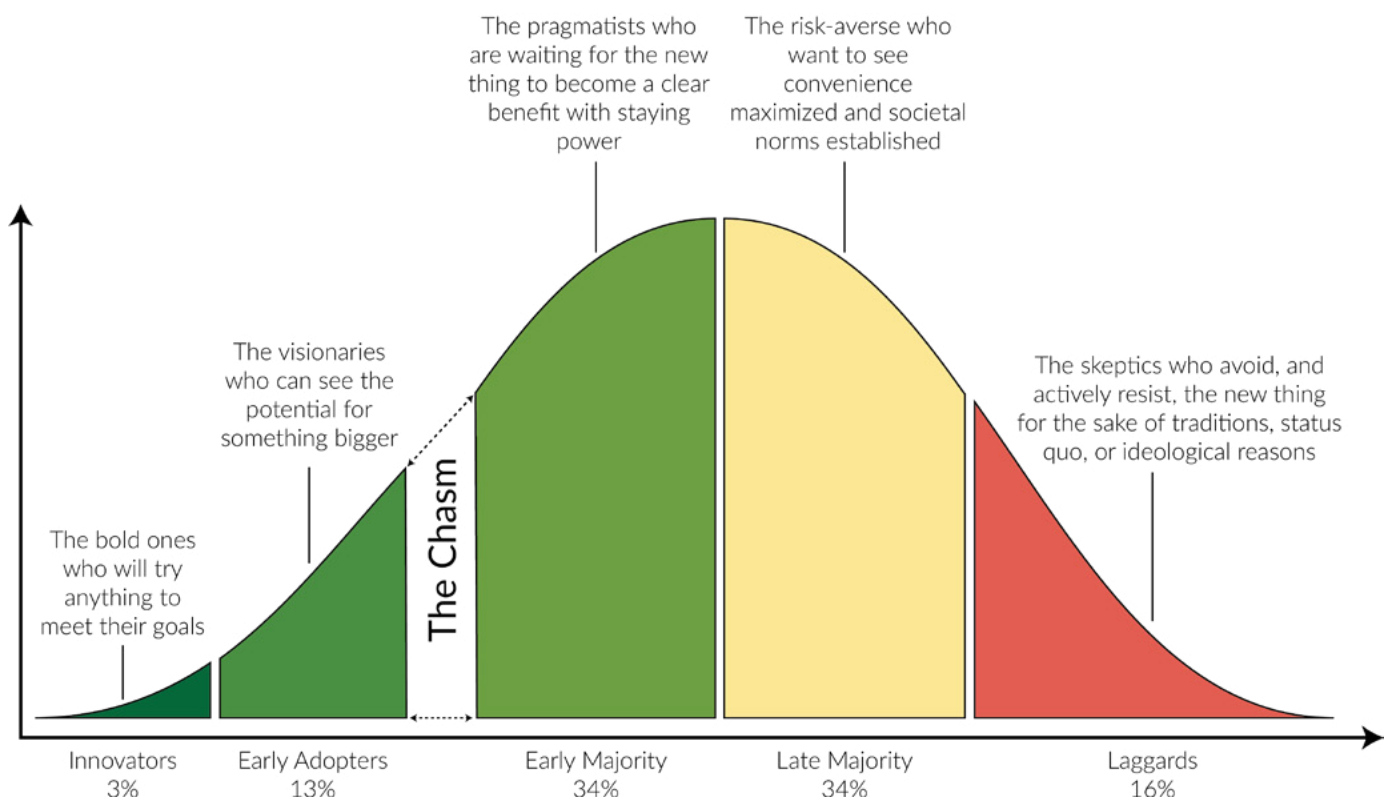


Figure 2. The Rogers innovation adoption curve (adapted by Norm Wright)

- By that time, the only individuals who don't engage in sustainability are those who are staunchly against the idea. These are the **laggards**, whose core preferences and ideals are so significant as to be worth the inconvenience and cost of withholding support. This group often does come along, despite its preferences, but it is least amenable to the change and withholds its support for as long as possible. This group comprises the last 16 percent of the population.

When the adoption of an innovation transitions from innovators and early adopters to the early majority, it is known as “crossing the chasm.” This is critical to the task of expanding sustainable development. The early majority is the group that is sufficiently large enough to provide voter support for bond levies, policy changes, and capital investments that can make a city more sustainable. More importantly, this is the group that provides sufficient demand and usership rates to make sustainability services such as transit sustainable (for lack of a better term). **Thus, planners must understand the pragmatic needs of the early majority cohort.**

Unlike innovators and early adopters, the early majority does not make its decisions based on firmly held moral principles or deep-seated allegiance to an idea. Instead, this group prioritizes convenience, reliability, and proven practical benefits. For cities to be able to make the investments that lead to greater sustainability, they must ensure that such investments offer clear, tangible benefits along these lines—lines that are better understood through the 5A approach.

Creating Truly Sustainable Communities

What makes a great sustainable city? It takes more than the presence of mass transit, urban parks, and renewable energy. These and other features must be designed and developed in a way that fosters broad usage by a diverse range of people. As mentioned earlier, diversity in this context refers to the wide variation in what residents prefer and need.

The 5A planning approach can help us recognize that some people value accessibility above affordability. Others prefer attractiveness over availability. And as a person spends more time in a sustainable city, their awareness increases and these preferences often evolve. This is why the question “What makes a great sustainable city?” has different answers for many different groups of people.

Mapping these groups of people within the segments of the Rogers curve can provide a new perspective on how a city becomes truly sustainable. It helps us understand where and how sustainability efforts can stall. Even when there is strong initial support for something like a new transit-oriented development, if that support doesn't grow to a broader share of the community, the next development will stall.

To create broader support requires that “crossing the chasm” moment in which sustainability's benefits are so immediate, and so multifaceted, that adoption and changes are embraced by an early majority of people. Such a trajectory is easy to understand, but how does it happen?

Evolution is the key. What makes a sustainable city successful at first will not be the source of its continued success. At the start, the city's services and amenities might cater to its innovators, then to its early adopters, with its original design. But the all-important next segment, the early majority, will need to see new benefits supporting a new set of preferences for adoption to grow. Each of these three groups has a different set of needs, and their basic expectations are highlighted below.

Who Are the Innovators?

The innovator market segment represents the first group of customers who adopt a new product. In the context of sustainable cities, there are two groups of innovators. Both live sustainable lifestyles but for very different reasons.

For one group of innovators, sustainability is a way of life. As advocates, they are most likely to vote yes for the bond levies and new policies that make transit and density possible. They will ride bikes on city streets that lack proper lanes. They will choose smaller homes near their workplaces to avoid a lengthy car commute from the suburbs. For this group, environmental knowledge correlates with environmental action, and they will therefore come up with innovative solutions to make it happen, no matter what. This group values sustainable cities so much that they will strive to make their surroundings sustainable in ways that will seem to other groups to be inordinately risky, costly, or simply less convenient.

While this first group of innovators *chooses* the potentially less convenient options to live their sustainable lifestyles, the second group of innovators is *forced* to follow this less convenient lifestyle due to a lack of options. For example, people who can't afford a car and who live in a neighborhood without public transit connections might have to use a bicycle as their only available means of transportation. Unlike the other innovators, they don't choose the bike to be more sustainable; they are forced to use it to be able to live their lives.

Planners don't have to worry about the first group of innovators. They will do whatever is possible to live sustainable lifestyles, no matter the cost or inconvenience to get there. Later along the curve, those innovators will be important stakeholders for creating awareness and understanding the benefits of sustainability in their city. But for those who innovate out of necessity, planners must support these efforts by providing what is needed to make those options safer, more convenient, and overall, more attractive. For the above example, this would mean building bike lanes, adding greenery, and creating an environment in which the innovator's lifestyle becomes attractive and desirable.

How Can We Reach the Early Adopters?

While the innovators embrace (and often create) a city's sustainable features, the early adopters watch closely to see what might benefit them. Often referred to as the “visionaries,” the early adopters see products, services, and technologies less as an expression of their identity and more as a powerful means to an end. These groups aren't the first to purchase

an electric vehicle. Instead, they wait for the second or third generation of EVs that come with the attendant refinements. This group won't risk their lives to ride their bikes on a city street; they wait until a safe bike lane is available that fits their needs.

While inspired by the innovators, early adopters need to “envision” how the sustainable option provides them with better opportunities to achieve their goals. The sustainable city must offer investments, services, and improvements that showcase a long-term commitment to sustainable growth. This is the signal early adopters need to feel safe in making investments of their own.

Within a city, the early adopters are always looking for the cluster of innovators that create an enclave of new sustainable activity. Rising popularity is a signal that gives the early adopter confidence. For example, as a sustainable city grows, it maintains a dense footprint of amenities, destinations, and housing. This leads to greater availability of goods and services. When these things are assembled well, with great design and functionality, the early adopter can quickly recognize the synergy of the area and how that, in itself, will drive more growth and greater benefit. The early adopter wishes to arrive ahead of the curve and be in the best position to grow with the city into its next stage.

For many U.S. cities, this is how far we have gotten. Innovators embraced sustainable behaviors and lifestyles independent of what the city had to offer, city governments started to implement a few sustainability actions to accommodate those actions (e.g., they built a few bike lanes here and there to address safety issues), and the early adopters started coming. Unfortunately, this is where sustainability ends for many places; it never crosses the chasm. How can we get from the early adopters to the mainstream?

Using the 5A Planning Approach to Cross the Chasm

If innovators blaze the trail, the early adopters pave it. Doing so makes way for the early majority—the most important market segment in the Rogers curve. The early majority symbolize the tipping point when a new product, service, or even an entire city can provide its benefits to the masses.

The early majority comprises people who want to live their ordinary lives in the most efficient and convenient way possible. They also want immediate benefits at a low cost. Cost, in this case, can refer to time, money, or energy. How can we reach them? This is where the 5A planning approach comes in.

For this group to change their behaviors or lifestyles, sustainability amenities must be *available*, *accessible*, *attractive*, and *affordable*. In addition, people in this group need to be aware of the benefits of changing their behavior; otherwise, they won't do it.

Continuing the bicycle example, this means that a city-wide robust bike lane network needs to be *available*; it needs to be *accessible* from any point of the city, not just a few; and it needs to be *attractive*: safe, convenient, and beautifully designed.

While bikes are already less expensive than cars, monetary incentives such as tax credits or other programs can make this sustainable option even more *affordable*. At the same time, the availability of lanes for cars must be reduced (e.g., by implementing road diets), accessibility for cars can be limited (e.g., by reducing curb cuts), driving should be perceived as less attractive and more expensive (e.g., reducing parking spaces and raising parking rates), and so on.

And once the critical mass of the early majority is *aware* of all the benefits of this sustainable option and the disadvantages of choosing the unsustainable option, the rest of the curve is thankfully “downhill.” The early majority will be the ones who will promote greater awareness and draw the interest of the late majority.

Once this broader adoption occurs, and everyone's preferences and needs can be fulfilled, the product becomes a “mass product” and goes mainstream. Usage and revenue can drive costs further down while providing high levels of quality.

Making Sustainability Mainstream

Returning to the earlier comparison between the cities of Vienna and Chicago, their differences make more sense when viewed through the lens of the 5A planning approach and the Rogers curve.

Vienna, it appears, already serves the early majority. Many of the five As have been implemented in Vienna and incorporate both positive and negative reinforcement. For example, parking in Vienna is limited; in some areas it is difficult to figure out how or where to pay, which makes driving unattractive. Meanwhile, Vienna's transit authority Wiener Linien sells annual transit passes for €365 (€1 per day), tickets can easily be bought online, and trains and buses are usually available within one to five minutes from nearly everywhere in the city.

However, Chicago has only reached the early majority. The city has accommodated sustainable behaviors for some, but not for everyone; it touches on some of the As, but not all of them; and it provides systems and services that allow for sustainable alternatives, but these are not necessarily more affordable, attractive, accessible, and the most economical fare option is a 30-day transit pass costing \$75. All of this makes driving still a very attractive mode of transportation.

When we view our residents as consumers who make choices and decisions for a variety of reasons, we can recognize how a sustainable city must meet each group's distinct set of preferences and needs. Too often, our public services and amenities are developed at the lowest possible cost, guided by the notion of fiscal responsibility. Such projects fail to satisfy any group's needs and, over time, the investments crumble under the weight of neglect. If a sidewalk is constructed, yet few people feel comfortable using it, how can we consider this a success?

Some residents will have no choice but to use such facilities, even when they are poorly built. A city's services will always be developed to serve them. But these residents, too, deserve the dignity of living in a city that can acknowledge not just their needs but also their preferences. For some, the preference is for

greater affordability. For others, it is for greater attractiveness. This is why it is important to remember that the 5A approach allows us to see how market segments are not determined by income or education. It is one's identity as an individual who values each of the five As in their own special way, a way that translates into a pragmatism that makes sustainable cities so compelling in the first place. It crosses the boundaries we normally place between people. It unites residents into a new mainstream.

This does not happen overnight. Nor does it happen with the perfect product delivered at the very start. Instead, as observed in many other consumer industries, the initial product for the initial customer is refined repeatedly, expanded, and improved to be more beneficial to all the consumers who have yet to adopt it.

Action Steps for Planners: Getting Started

An understanding of the 5A planning approach and the different market segments of the Rogers curve applies not just to bicycling or taking public transit, but also to the adoption of renewable energy, dense and walkable neighborhoods, or sustainable consumer products, among many other things that together will eventually create a truly sustainable city where people can live their ordinary lives in sustainable ways. Using these two

frameworks, planners can look at their next long-range planning effort and find new ways to address old problems. It starts with an understanding of how people use the built environment today.

Streets and sidewalks have trip data. Parks have visitor information. Our downtowns have business activity, rental rates, parking activity, and foot traffic volumes. This information provides clues about how popular and valuable these community assets are. But rather than seeing the information as numbers that represent an entire population, planners can gain deeper insights by building profiles that capture more specific insights along the segmentation of the Rogers curve.

For example, if data indicates that only 20 percent of a city's residents use bike/pedestrian/transit alternatives, this suggests that the system has reached all the innovators and early adopters but only a very few of the early majority within the broad population. This, in turn, means that the system is lacking sufficient benefit for the rest of the all-important early majority to get on board, which will then increase the probability that the late majority will come along. The focus, then, shouldn't be on the entire population (i.e., the missing 80 percent). Instead, the focus should be on the gap between the current 20 percent and the next 30 percent of people that allow the city to reach its full early majority cohort.

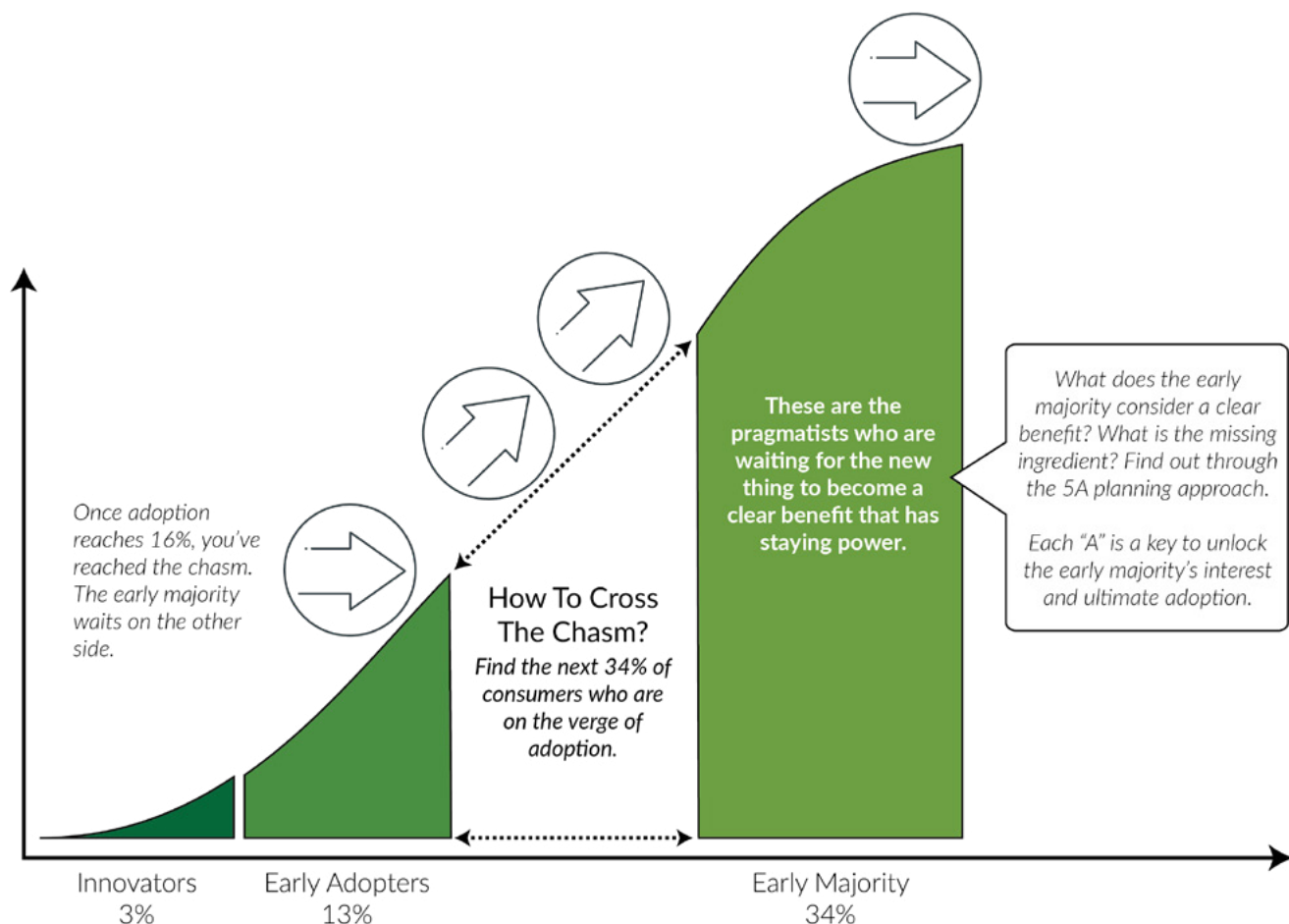


Figure 3. "Crossing the chasm" from the early adopters to the early majority (Norm Wright)

In other words, the Rogers curve should help us see the next step in a more refined, granular fashion (Figure 3, p. 9). It should help us strategically design new ways to build services and infrastructure that lead to the tipping point of widespread adoption and mainstream popularity.

Addressing Individual Needs and Preferences

In this new paradigm, a bike network is no longer analyzed on its geographic coverage or overall connectivity for the entire service area. Instead, it is analyzed for its ability to meet the specific needs of the next cohort—the rest of the early majority in this case—while retaining the usage and loyalty of the previous cohorts—the early adopters and innovators.

How will we know what the next cohort wants? By using the 5A planning approach to understand the early majority. In this way, the central question of our work shifts from “Why don’t people use our bike lanes?” to something more empathetic, focused on the cohort’s preferences and needs, such as “Why do they need to drive?” (assessing the root causes of what makes them leave the house such as doing groceries, going to work, etc.) and “What would people need to see to make biking as enjoyable as driving while being able to address their actual need?” (understanding the preferences: e.g., buying furniture might be impossible by bike, but getting to work and dropping off a baby at daycare could be doable by bike if safety is provided).

The key is to recognize that people choose between sustainable and unsustainable options just as surely as we choose between healthy and unhealthy food. In this case, the options are automobile versus nonautomobile travel. And while the answers may seem obvious at first (e.g., people drive cars because it is more convenient), the 5A approach helps us look at the questions holistically and in greater depth. The answers to the questions will vary from person to person and topic to topic, and the 5A approach will give structure to the responses as every individual response will fit into one of the five As.

When seeking answers to the questions, the research should be as detailed and exhaustive as possible. This work is akin to product research conducted in the private sector: finding insights into what people want and need to develop the product that can provide it.

Planners should canvas whole neighborhoods. Send surveys far and wide. Conduct focus groups and perform observational studies. Study the community’s social media and find the specific issues and the general sentiment. Remember that the 5A approach helps us see how people value different components of the built environment to solve their problems and live their lives. If the early majority isn’t using a bike lane, it is because they have a better alternative. What are those alternatives and how can the bike lane system be improved to offer a more competitive advantage? This also includes the consideration of physical limitations, including disabilities. If someone is physically unable to ride a bike, planners must provide other sustainable alternatives that can meet these specific needs.

This research will take months to develop. It will require a shift in analysis. When looking at the city, planners typically focus on public policy, capital improvements, engineering, and design. But now, in this paradigm, we must shift our stance and become marketers and product managers instead. We need to develop a far greater understanding of how our early majority population thinks, what they want, and how we can get it to them in a manner that is at least as accessible, attractive, available, affordable, and with as much awareness as all other alternatives. The 5A approach helps us see this. When complete, our analysis should give us a detailed profile of our target audience: the most immediate cohort yet to be served.

In many cases, existing infrastructure (like bike lanes) already serves some people. Those people invariably include the innovators, as they are the ones who take great pains to engage in sustainable action even when the five As aren’t very well satisfied by any other group’s preference set. This group represents approximately three percent of the total service population or “addressable market.”

If your research shows that more than three percent of the total population actively engaged in these sustainable behaviors, then you have at least ventured partially into the early adopters group. And this is likely where usership reaches its natural limit without significant change. As stated earlier, the early adopters are amenable to change in the name of achieving sustainability. If total usership has reached at least 16 percent of the total population, you have likely served the early adopters well.

This means that the next group, the early majority, will be the target group to focus on. This group is the pragmatic bunch who, when satisfied, naturally lead a system (like bike networks) to function in a way that can now extend to later groups. Together, the innovators, early adopters, and early majority constitute 50 percent of the total service population. So if usership is between 13 and 50 percent, some within the early majority still need to be better understood and better served.

Almost all sustainable services have work to do for this cohort. The question is whether the previous cohorts have been effectively served first. If not, it is vital to build momentum by identifying and addressing the needs of the next available group—the innovators if usership is below three percent, the early adopters if usership is below 13 percent, and the early majority if usership is below 50 percent. Once all of the early majority are on board, conditions should be right for the late majority to follow suit.

Balancing the Five As Across All Cohorts

Once the market cohort needs are known, planners can begin developing design solutions. This requires creating multiple solutions that emphasize different elements of the 5A planning approach.

If the early majority wants to see more protected bike lanes, which cost more per mile, then one design will provide fewer lanes per mile but more protection—a trade-off between attractiveness (more safety) and availability (fewer lanes).

And if the early majority has affordability concerns, perhaps because they do not own bicycles, then another solution could provide a city-sponsored mobility hub with low-cost bike rentals and repair stations. Finally, some members of the early majority might be uneasy about traveling by bike because they don't feel welcome; the streets can be a hostile environment for cyclists. So one solution might emphasize awareness and accessibility above all else, with significant signage and awareness campaigns (i.e., Share the Road) to emphasize cyclists' legal rights of access and compel automobile drivers to keep a safe distance and speed.

With fixed budgets of money and time, no single solution can maximize the five As for everyone. Not at first, anyway. So the next step is to test the variety of designs by revisiting the community and learning what they like or need most. This is the second round of market analysis with new focus groups, open houses, and surveys to see which alternative is best.

However, unlike the usual community outreach effort, here the "best alternative" is defined strategically to focus on the group that shared the most common set of preferences. The best alternative is not the one that the majority of the community favors in some abstract sense. Instead, the best alternative will be the one most favorable to the target cohort—the early majority—and most likely to compel their adoption (i.e., inspire them to take up cycling for their regular commute).

Using the 5A approach and the Rogers curve shifts the paradigm; it focuses on the next segment that can grow mainstream success rather than the community as a whole. This will take a leap of faith for some. It can be very disorienting to favor a specific group instead of the majority. But planners must remember that widespread adoption of any product or service follows the Rogers curve. If 70 percent of a city's residents are currently avoiding all bike, pedestrian, and transit methods, we can only help them do so by serving the next 20 percent that might. Crossing this chasm to capture the early majority will give us a chance to grow the network further and seek the next 34 percent of the late majority. This is how we can actively manage the city for greater benefits—by finding ways to address the next available group of people so that, in turn, we can reach the next group after that.

Every mainstream product and service has taken this approach on the way to ubiquity. Netflix began as a niche DVD-by-mail service championed by the innovators who happened to be internet savvy and weary of Blockbuster's late fees. With their support, Netflix continued to reinvest in its catalog until an early adopter group came on board. But it wasn't until the shift to becoming a streaming company, airing their content directly to the consumer, that Netflix was able to cross the chasm and bring the early majority aboard. From there, the tipping point was reached, and Netflix became what it is today. We have seen this story unfold in many different ways for consumer products and services.

The key is to recognize that our city amenities and services are subject to the same dynamic. People will choose to

live and act sustainably when it suits them. The five As can explain their choices in a societal context. The Rogers curve helps us understand where these factors affect people at different stages of a product and service lifecycle.

To use these concepts fully, engage in a market analysis with your next long-range planning effort. Focus on a specific service or feature of the city that offers people more opportunities to live and act sustainably, such as a park, street improvement, or downtown district. Remember that every facet of the city offers us a meaningful chance to reduce our carbon footprint, improve our connections with others, strengthen our local economy, and improve our broader sustainability.

Look at the focus area through the lens of a product manager. Imagine yourself trying to achieve greater market penetration. How are people using this area today? What is it about the use and the area itself that promotes sustainable behavior? What does the area offer that other alternatives do not? What makes it better or worse than the unsustainable alternatives that people use? What barriers or missing features prevent others from joining in on the sustainable activity? Which market segment are we currently addressing in a consistent, reliable fashion? To find the answers, embark on the first stage of market analysis. This includes surveys, observational analysis, focus groups, and demographic analysis. Find out what people would want to see to use the area more frequently. Sort the answers along the 5A approach and then build a segmentation across the Rogers curve.

Then develop your solutions in a way that will benefit the next available cohort. Create multiple options and alternatives. Rate their strengths and weaknesses according to the 5A approach. Then return to the community and conduct further analysis until you can confidently see the pattern of what the next available cohort needs to use the area. When that's done, the rest is implementation, followed by regular monitoring, analysis, and planning for reaching the next available cohort once again.

Conclusion

What got us here, in terms of sustainable development, won't get us where we need to go. Cities have made a lot of good progress, some more than others. The conventional methods of benefit-cost analysis and majority-rule design, however, will not lead to greater mainstream adoption. Planners need to adopt a new paradigm. By breaking down the community into its natural consumer groups, as established by the Rogers innovation adoption curve, and using the 5A planning approach and its focus on availability, attractiveness, affordability, accessibility, and awareness to understand and respect the choices the individuals in each group make, planners can better serve the next available group of people who are ready to engage in sustainable living. Only in this way can we successfully support the individual behavior changes necessary to result in communities that are truly sustainable.

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