Communicating Research Through Comics:
Transportation and Land Development

Final Report # NITC-RR-1532

by

Kelly J. Clifton, University of British Columbia
Kristina M. Currans, University of Arizona

for

National Institute for Transportation and Communities (NITC)
P.O. Box 751
Portland, OR 97207

May 2023

Technical Report Documentation Page

1. Report No. NITC-RR-1532	2. Government Accession No.	3. Recipient's Catalog No.

4. Title and Subtitle Communicating Research Through Comics: Transportation and Land Development	5. Report Date May 2023
	6. Performing Organization Code
7. Author(s) Kelly J. Clifton; Kristina M. Currans	8. Performing Organization Report No.
9. Performing Organization Name and Address National Institute for Transportation and Communities (NITC) P.O. Box 751 Portland, OR 97207	10. Work Unit No. (trais)
	11. Contract or Grant No.
12. Sponsoring Agency Name and Address U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology 1200 New Jersey Avenue, SE, Washington, DC 20590	13. Type of Report and Period Covered
	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This project created a transportation comic, "Moving From Cars To People," which offers a succinct and fun introduction to a complicated topic: namely, how the built environment in the United States came to be designed for cars and what we can do about it. The comic includes a dialogue, taking place in various urban settings, between characters Kelly and Kristi who are based on the two principal investigators, Kelly Clifton and Kristina Currans. The two have a long history of collaboration around the data, methods, and processes used to plan for multimodal transportation impacts of new development. This short graphic synopsis is an engaging, approachable way for anyone – no matter their level of expertise in this topic – to learn about their findings. Illustrated by PSU Master of Fine Arts student Joaquin Golez, the comic was authored by Clifton and Currans and developed in conjunction with Susan Kirtley, director of the Comic Studies Program at Portland State University (PSU), and Portland, OR-based illustrator Ryan Alexander-Tanner, who has worked on academic comics before and drew on his experience to help guide the collaborative process. A Spanish-language version was created with the assistance of Urban Studies PhD student Gabriel Quiñones-Zambrana.

In this report, we outline the background of the research this comic aims to communicate, followed som
From there, we describe the tool itself—a comic book—and the process by which we developed it. Lastly, we describe the recommendations for disseminating and using this comic book as a communication tool.

17. Key Words Transportation, land development, comic, communication	18. Distribution Statement No restrictions. Copies available from NITC: www.nitc-utc.net

19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. No. of Pages 14	22. Price

ACKNOWLEDGEMENTS

This project was funded by the National Institute for Transportation and Communities (NITC; grant number 1532), a U.S. DOT University Transportation Center. We would like to thank Research and Graduate Studies (RGS) and Comic Studies at Portland State University for their financial and in-kind support of this project. In particular, a special shout out goes to Jason Podrabsky, Interim Vice President of RGS at PSU, for being a visionary leader and seeing the value of comics as a communication tool for researchers.

The comic was improved with the feedback and commitments from our technical reviewers, including Kenneth Stahl, Anne Hill, Susan Handy, David Somers, and Wes Marshall, and the community members from Portland Oregon and Tucson Arizona. Tiny Kimmy and Evren Sonmez were invaluable in helping us get community feedback. Cait McCusker provided early input to shape the project. Amy Spring, John MacArthur, and Kacy McKinny gave their time to a hands-on workshop. This project was inspired by the comics courses offered by Portland Community College continuing education. It would not have come to light without the encouragement and knowledge gained from Ryan Alexander-Tanner, T. Edward Bak, and Sarah Mirk.

A special thanks goes to Ryan Alexander-Tanner for his mad comic skills and keeping us on task; Susan Kirtley for shaping the narrative and championing our vision; and Joaquin Golez for making our words come to life. Thank you to Gabriel Quiñones-Zambrana Spanish translator and PhD student in Urban Studies from Portland State University for translating our comic to Spanish. This comic could not have been completed without the hard work of this interdisciplinary team.

We dedicate this comic to $Bill.

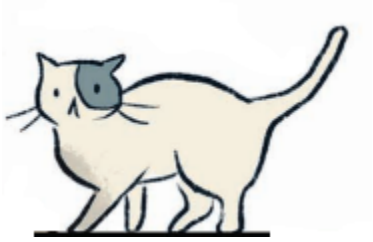

Figure 1. This is a cat. (Clifton et al, 2022)

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RECOMMENDED CITATION

This report: Clifton, Kelly J.; Currans, Kristina M. *Communicating Research Through Comics: Transportation and Land Development*. NITC-RR-1532. Portland, OR: Transportation Research and Education Center (TREC), 2023.

Comic Book: Clifton, Kelly J.; Currans, Kristina M. Illustrated by Joaquin Golez. Edited by Ryan Alexander-Tanner and Susan Kirtley. *Moving from Cars to People*. Published by the National Institute of Transportation and Communities, 2022.

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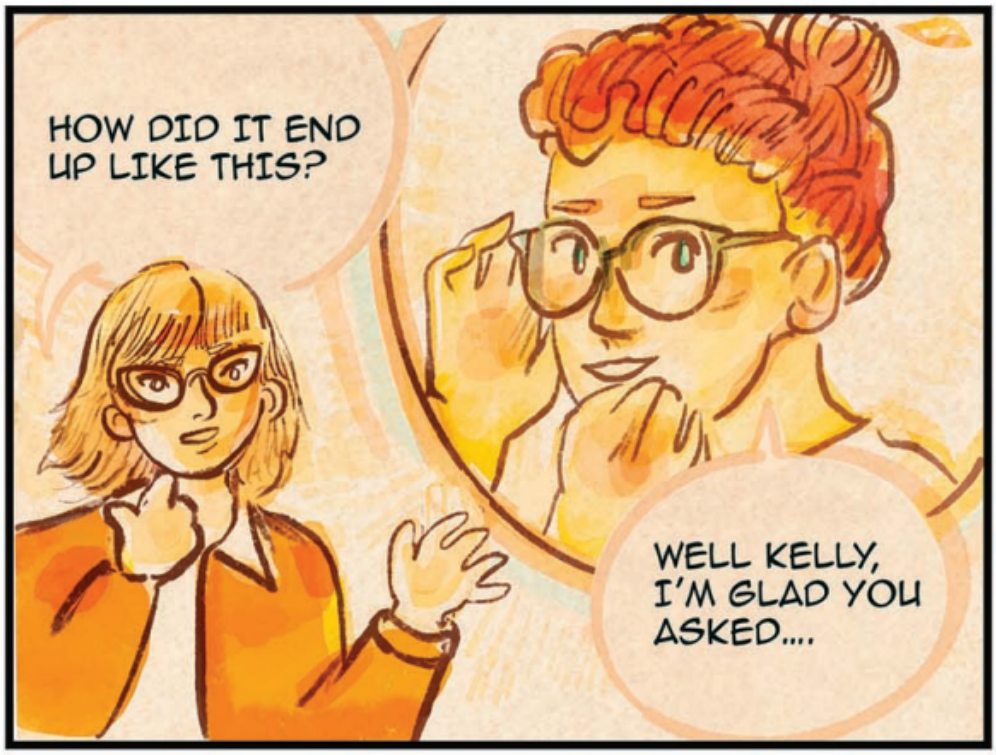

Figure 2. A panel from Clifton et al (2022) comic

1.0 INTRODUCTION

This project aims to translate research findings from several NITC projects (PI Clifton) about considerations of transportation in the land development process into a comic, thus enhancing comprehension, encouraging representation, and developing a wider audience for this critical information. Namely, PI Clifton and coPI Currans have a long history of collaboration around the data, methods, and processes used to assess, mitigate, and plan for multimodal transportation impacts of new development. Their research has supported cities in developing frameworks that are more equitable, sustainable, and multimodal. Despite these advances in knowledge, there are limits to their implementation, in part, because of lack of understanding. In more progressive public agencies, there is often pushback from constituents who seek to protect the current paradigm, which privileges the automobile and with that wealth and whiteness. In other places, the public agencies themselves need to be educated about the latest research so that they can change internal processes and do a better job communicating with the public.

To this end, this project will utilize a popular and accessible medium – comics – to communicate and disseminate this knowledge widely. Comics are "juxtaposed pictorial and other images in deliberate sequence, intended to convey information and/or produce an aesthetic response in the viewer" (McCloud, 1993). In conjunction with faculty from the Comic Studies Program at Portland State University (PSU) and independent artists, we will develop a digital and limited print edition comic that translates these concepts into an educational tool. The ideas and the comic itself will be vetted and tested with the input from PSU students, a technical advisory committee (TAC), and community advisory committees (CAC). The final product will be freely

available for wide dissemination in digital form. Using this comic as a demonstration, a workshop about communicating research results with comics will be conducted at PSU for faculty and students.

2.0 BACKGROUND OF PRIOR PROJECTS

The development of this comic was a technical transfer project, building on prior research projects and scholarship. In this project, our aim was to create a comic that communicates the history and evolution of evaluating the transportation impacts of land development.

Why communicate research results in a graphic format? First, to reach a broader audience. It's in everyone's interest for non-transportation-professionals to have a working knowledge of the conversation that's happening around sustainable transportation options. When important policy questions show up on a ballot – for example, whether businesses should be required to provide a certain amount of parking spaces, or whether the state should subsidize public transit – people who aren't in the transportation industry might not be fully aware of the tradeoffs involved in these questions.

NITC researchers have approached context-sensitive travel modeling from several angles. For example, Reid Ewing of the University of Utah developed some key enhancements to the classic four-step travel demand model, as well as examining trip and parking generation at transit-oriented developments. Clifton and Currans first worked together at Portland State University when Clifton was Currans' advisor for her 2016 doctoral dissertation examining data and methodological issues in assessing multimodal transportation impacts for urban development.

Both separately and in collaboration with other NITC researchers, the authors have a long history of research collaboration on coordinating transportation and land development (see relevant NITC and other project reports: Clifton and Currans 2019; Clifton et al. 2018; Clifton et al. 2017; Bochner et al 2016; Clifton et al 2013a; Clifton et al.; 2013b; Clifton et al. 2013c). To date, their research findings have had a transformative impact on the development of the data and methods used in transportation impact analysis (TIAs). Their work has been included in the latest edition of Institute of Transportation Engineers *Trip Generation Manual* (2020) and *Handbook* (2014), the industry standard referenced for trip generation data. They have advised the local governments of Portland, Bend, Clackamas County on their development review process and methods for assessing transportation system development charges. The State of California has considered their findings in the CEQA analysis related to climate change (Clifton et al 2018). This body of work has produced new knowledge and contributed to making the land development and transportation planning process more equitable, multimodal, and environmentally sustainable. Outcomes from these projects have a Technology Readiness Level of “Implementation”.

3.0 THE ISSUE WE AIMED TO ADDRESS

Despite having a receptive audience among transportation planners in public agencies in Portland, San Francisco, Los Angeles, Washington, DC and other progressive cities (Combs & McDonald 2021), there are still barriers to widespread change from traditional development review processes that privilege the automobile to new approaches that place top priority on people. One of the pervasive challenges comes from community members' lack of understanding of the complex issues involved in TIAs and the land development process. For example, NIMBYs (Not-in-my-backyard) have successfully blocked development of multifamily and infill housing, including much needed affordable housing, in many neighborhoods around the country (Holleran 2021). Their fears of increased traffic congestion are often erroneously supported by these antiquated, automobile centric approaches, contributing to the affordable housing crisis experienced by every county in the U.S (Boarnet et al 2017). The findings from our research and others need to be more widely communicated to the public in order to broaden understanding of the problem and policy solutions.

Wider dissemination of this information combined with a format that is accessible and approachable may help educate the public about a wide variety of transportation and land use issues. One avenue for this is comics, which presents a story using text and images, resulting in a high visual literacy, and has long been recognized as a pedagogical tool. Comic art maintains a long history in educational circles, from Will Eisner's P.S. magazine in WWII to Martin Luther King and the Montgomery Story's role in promoting civil disobedience. Comics offer several advantages: the pace at which information is taken in is determined by the reader (unlike classroom lectures or film); difficult concepts can be simplified with visuals, and they are a popular medium across a variety of demographic groups (Yang, 2008). To this end, comics have been widely used in teaching and science communication across a variety of disciplines (Scavone et al. 2019).

4.0 THE TOOL: A COMIC FOR EDUCATION AND ENGAGEMENT

The project resulted in an in-print and digital comic—*Moving from Cars to People*— in English and Spanish that can be widely disseminated for free to explain aspects of the transportation and land development process to a lay audience. The comic is written in an accessible and jargon-free language that uses both images and text to explain key points with an enjoyable storyline and with representation of a variety of people of ages, races, genders, sexual orientations, and abilities. The comic is an educational and engagement tool as it can be used as a starting point for discussions about the transportation and land use system with students (secondary and post-secondary education), community organizations, and advocacy groups.

The 20-page color comic has three articles:

- "All about the car" - This article describes the history of planning for the automobile, the development of automobile-centric transportation planning tools and standards, and ITE's Trip Generation Handbook and Manual.
- "How did we end up with this crappy built environment?" - The article builds on the concepts from the first article and explains the process of coordinating transportation and

land development, including transportation impact analysis, trip generation data, level of service, and mitigations.

- "People, places, and perspectives" - The final article focuses on people and how they are impacted by this process, new policies to move away from the automobile, and neighborhood change.

The project team was interdisciplinary and included two NITC transportation researchers (Kelly Clifton from Portland State University and Kristina Currans from the University of Arizona), a professional comic author and editor (Ryan Alexander-Tanner), English professor and Director of Portland State University's Comics Studies Program (Susan Kirtley), a masters of studio art student (Joaquin Golez from Portland State University), and a Spanish translator and PhD student in Urban Studies (Gabriel Quiñones-Zambrana from Portland State University). Given this disciplinary composition, the team took several months to learn from each other including the process of making a comic, the substantive material we wanted to convey, and storytelling with text and images. After deciding on the three article format and themes above, the group began the iterative process of buildinging the narrative with text and images.

The narrative building process started by assigning a draft of the main points for each page of the article to convey, as shown in Figure 3 below. These collection of points set the foundation for the story arc for the article. From there, the iterative process of developing the narrative building process began, as shown in Figure 4. A draft of the text, including character dialogue, was developed for each panel on each page. Not surprisingly, the first draft of the authors' narrative proved too much text for the comic. Several iterations in revising the narrative allowed the text to be reduced, focused, and free of jargon.This process also resulted in changes to the images with better interplay between them and the text as communication medium.

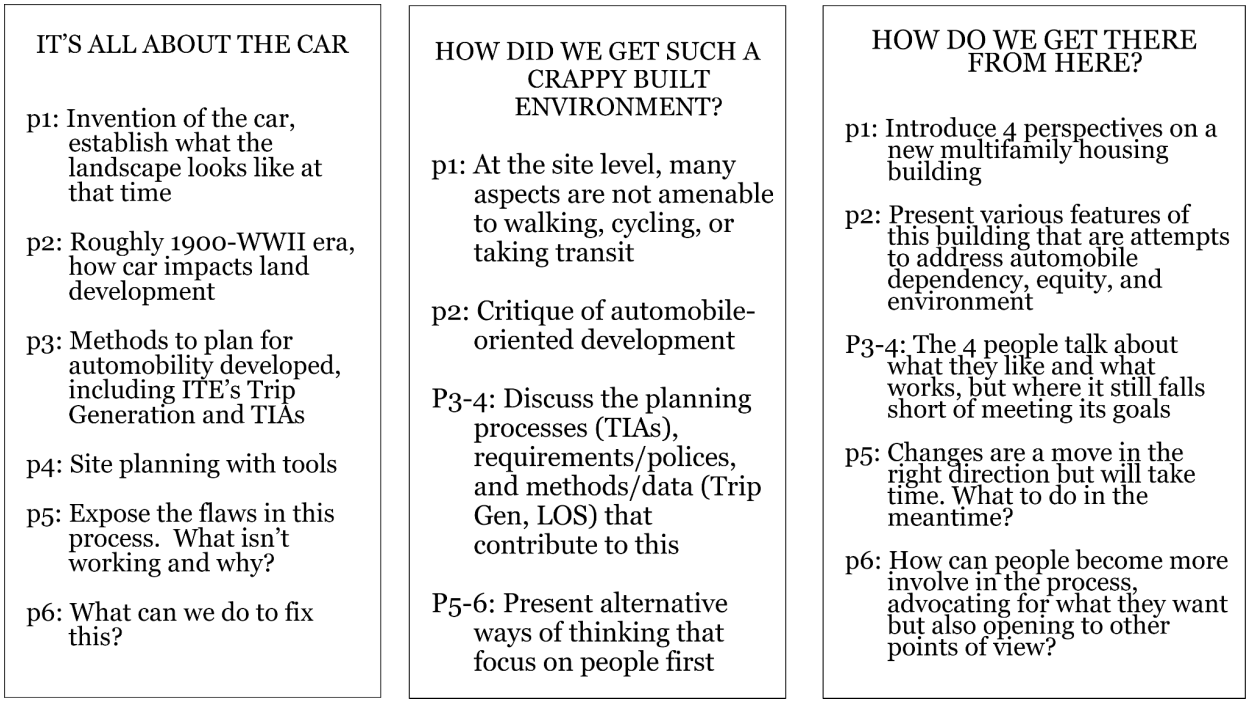

Figure 3. Draft article structure for each page

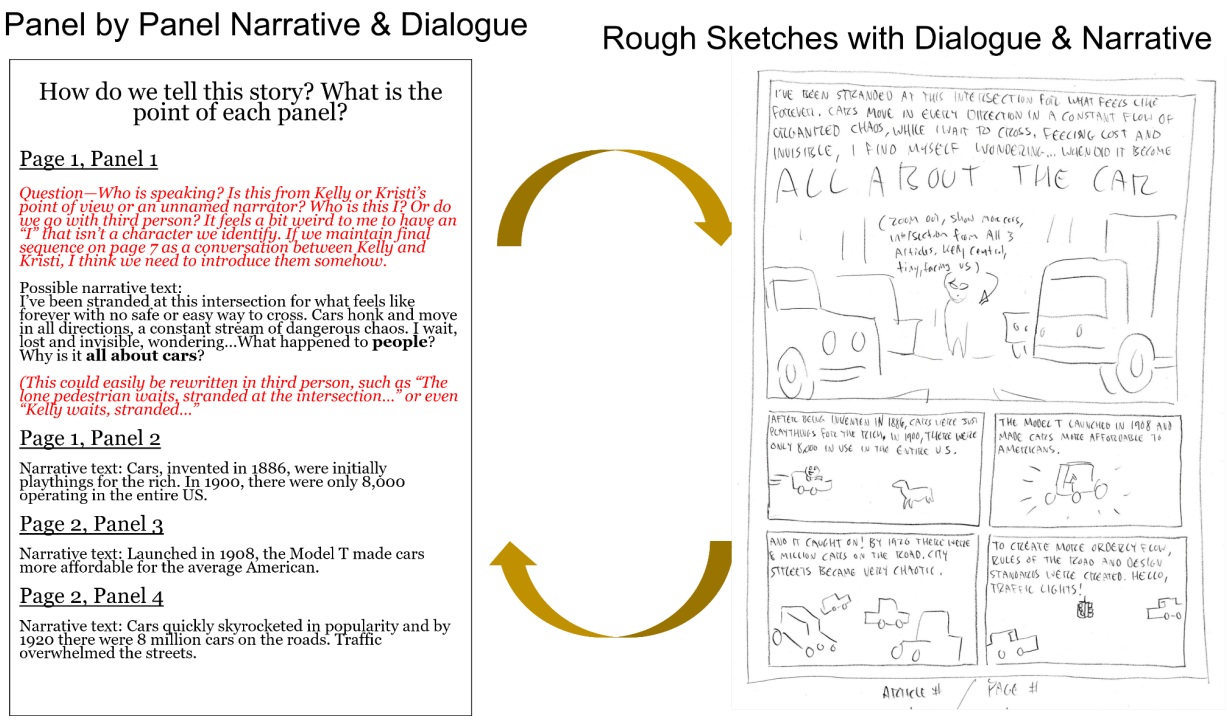

Figure 4. Iterative approach to developing narrative with text and images

Our original project plan included three opportunities to gather information about how well and in what ways our comic communicates this area of work: (1) student and faculty workshop; (2) Technical Advisory Committee; and (3) Community Advisory Committee.

First, we developed a workshop with our comic collaborators on using comics as a communication tool for disseminating research to the public. This included an in-person, original workshop held with faculty and students at Portland State University in fall 2022.

Second, to ensure that the project output is meeting its communication and education goals, a Technical Advisory Committee (TAC) was created inviting 12 transportation professionals nationwide to review materials at the critical stages when the comic art and text have been drafted. This helped ensure that the appropriate technical content was being conveyed. Participants in these committees will receive a printed copy of the comic book as a measure of gratitude for their participation and will be acknowledged in the copy. Originally, we hoped to convene the TAC at two stages—first, to consider an early draft of the narrative and second, to review a gray-scale draft of the comic before being colorized and polished. Early in the development of the comic, we found it was challenging to share early iterations of the dialogue and imagery. As a result, we were only able to capture TAC feedback during later stages of comic development.

Third, we originally aimed to convene a Community Advisory Committee (CAC), a small committee of community members from Tucson and Portland that could review and engage in discussion about our comic book and the context we were trying to communicate. We found it difficult to justify asking community members to review early and rougher drafts of the content, in part because early drafts were far more technical and difficult to share than expected but also because early drafts were during Fall 2021 through Spring 2022 when in-person meetings were

more challenging to justify scheduling due to the COVID-19 pandemic. This prevented us from scheduling this engagement concurrently with comic development and editing in the way we originally intended. Instead, we invited participants through our community partners to review a digital and colorized (almost) final draft of our comic along with a short, open-ended survey. We asked community members to reflect on the following: (1) whether the comic book makes sense; (2) whether the language (either English or Spanish) is free from jargon and easy to understand; (3) if they see themselves in the story line; and (4) if they enjoyed it. We did not receive enough responses to reflect on those comments here, but we believe evaluating the efficacy of the comic in communicating these concepts is an important next step in this line of work. In future work, it may be more fruitful to partner with existing neighborhood groups or visit events in person to create opportunities to discuss the comic book with members of the public at activities they are already participating in. Additionally, we might anticipate these discussions may need to happen much later in the comic development process.

5.0 RECOMMENDATIONS FOR DISSEMINATION AND OUTREACH

The audience for this nonfiction comic is the general public and the purpose is to provide better explanations for how cities coordinate transportation and land development, why previous automobile-oriented approaches fall short, and the evidence that supports new methods, processes, and policies. For example, many cities have relaxed or eliminated minimum parking requirements for multifamily housing developments. Many neighborhood groups oppose these developments as they fear inadequate parking supply for the levels of automobile ownership of new residents in the near term.

Despite the proliferation of non-fiction and fiction comics as communication and education tools, they are not commonly utilized in the transportation sector. Thus, this project provides a novel opportunity to introduce this medium into transportation courses, public outreach, and community engagement. They can enhance student learning by explaining complex concepts, complementing other course reading, and contextualizing examples. With respect to public outreach and community engagement, they have potential to facilitate and enrich these processes, required for most publicly funded transportation projects, by broadly disseminating information in a format that can be more easily understood. This can lead to better inquiry by the public and thus, better project outcomes. Another important equity and inclusion outcome of comics is that marginalized population groups, such as communities of color, immigrants, the elderly, or disabled people can be represented throughout the text.

Specific to the content of this project, many policies that encourage infill developments and mixed-use, multifamily residential development that include affordable units and support a variety of transportation options were created to meet community sustainability, environmental, livability, health, safety, and equity goals. These development patterns and the processes used to plan for and evaluate them break often with the historic precedent of low-density, automobile-oriented developments that are economically and racially segregated. They are often met with opposition by residents and business owners who are concerned about altering the character of the build environment, loss of parking, and changing demographics of

residents. Given this resistance and these concerns, comics offer a potentially powerful intervention that can help explain the motives of public agencies and the consequences of continuing to build the status quo. Further, it will present new ways of approaching the issue of coordinating transportation and land development that have been documented in the various projects led by the authors.

Similarly, we also see this comic as an education tool in the (university) classroom, as there are few texts that provide information about trip generation, land development, and transportation impact analysis. Further, the information that is currently available favors the use of the Institute of Transportation Engineers *Trip Generation Handbook and Manual* and *Parking Generation*, level of service, and automobile-oriented mitigations that research by the authors and others have shown to be flawed or problematic in meeting current planning goals. Additionally, this comic could be used in educational outreach programs that focus on inspiring high school-aged students to become interested in the transportation field.

The comic will be available digitally for free download and dissemination[1]. Thus, it can be used by public agencies, educators, advocacy groups, neighborhood associations, or the general public. A non-fiction comic may prove useful for agencies, advocates, and neighborhood associations who aim to communicate the benefits of sustainable and affordable development to constituents in an approachable manner.

Figure 5. A panel from Clifton et al (2022) comic

[1] PDF and web-formatted viewing files of both English and Spanish comics can be found on the NITC project page: https://nitc.trec.pdx.edu/research/project/1532/ (Accessed May 2, 20223)

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