

Towards a Method for Evaluating Bus Stop Infrastructure with Street Level Images and Large Language Models

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Abstract

In major cities, the bus system is a central part of public transport infrastructure. Yet, due to several reasons such as scale and lack of necessary funding, the quality of the available bus stop infrastructure varies wildly, severely impacting the experience of users, particularly those with disabilities. In this paper, we propose an approach based on automatic image description using Large Language Models to describe bus stops and their surroundings, with the goal of identifying their attributes. A mapping of this kind could be used by city officials to direct maintenance efforts, and by the general public, as a mean to select better options, whenever possible.

CCS Concepts

• **Human-centered computing** → **Accessibility systems and tools; Empirical studies in collaborative and social computing.**

Keywords

Bus System, Bus Stops, Public Infrastructure, Accessibility, Computer Vision, Large Language Models

ACM Reference Format:

Artur André Oliveira, Mateus Espadoto, Roberto Hirata Jr., Rafael J. P. Damaceno, and Roberto M. Cesar Jr.. 2024. Towards a Method for Evaluating Bus Stop Infrastructure with Street Level Images and Large Language Models. In *Proceedings of The Future of Urban Accessibility Workshop: The Role of AI (URBANACCESS'24)*. ACM, New York, NY, USA, 7 pages. <https://doi.org/10.1145/nnnnnnn.nnnnnnn>

1 Introduction

Mobility is an essential topic for urban planners and also a complex problem without definitive answers because it is highly dependent on factors such as city size, geography, available infrastructure, cultural aspects, and population size, to name a few.

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URBANACCESS'24, October 21, 2024.

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ACM ISBN 978-x-xxxx-xxxx-x/YY/MM
<https://doi.org/10.1145/nnnnnnn.nnnnnnn>

Related to that, there is the issue of accessibility for people with reduced mobility. Many countries around the world have laws that mandate the existence of accessibility features¹ in public transportation, such as wheelchair ramps, tactile floors, Braille descriptions, among others. Unfortunately, particularly in less developed nations, these laws are not always followed.

There is also the problem of determining whether the existing accessible infrastructure is well-maintained and usable. Public databases having this information may be outdated, and the existing infrastructure may be in a state of disrepair.

Considering the current developments in Multimodal Large Language Models applied to image description, in this work we propose an approach based on using these models describe bus stops, which are an essential part of bus system in large cities. Our aim is to leverage these models to describe bus stops and their surroundings, with the goal of identifying not only the availability of accessibility features, but also other features that impact the experience of the user, such as having a roof, properly-maintained sidewalks, markings for stop zones, to name a few. A mapping of this kind could be used by city officials to direct maintenance efforts, and by the general public, as a mean to select better options, whenever possible.

This work is organized as follows: Section 2 presents previous work in related areas; Section 3 presents the details of the proposed method; Section 4 details the experimental setup; Section 4.1 presents a brief discussion over the results; Section 5 concludes the paper.

2 Background

Several approaches have been proposed to leverage computer vision techniques for the detection and analysis of bus stops, as well as for enhancing the operation of public transport systems. For instance, Gerschuni and Pardo [5] present a computer vision-based method to automatically detect buses in preferential lanes as part of an intelligent transport system, aiming to reduce congestion by synchronizing traffic lights. Their work focuses on identifying moving buses, but it does not assess the structural features or accessibility of the bus stop infrastructure itself. Similarly, Frank and Ismail [4] introduce a real-time image processing system for guiding buses into bus stops using pose estimation techniques based on monocular image sequences. While this system is effective in improving

¹http://www.planalto.gov.br/ccivil_03/leis/L10098.htm, <https://www.ada.gov/topics/intro-to-ada>

the positioning of buses at stops, it is primarily concerned with the vehicle's interaction with the bus stop, leaving the evaluation of bus stop quality and accessibility unaddressed.

A more recent work is the BusStopCV system [6]. This system uses a real-time YOLOv8 model to automatically detect key accessibility features at bus stops, such as seating, shelters, and trash cans, within street-level imagery. However, BusStopCV focuses primarily on a narrow range of accessibility features, excluding broader considerations such as the overall structural quality of the bus stop environment, including tactile paving, road conditions, and wheelchair ramps. Additionally, Seyed and Ehsan [11] and Maina and Sánchez [10] present insights into detecting bus stops and assessing their accessibility through different techniques, but similarly, their work remains limited to specific aspects of bus stop functionality, rather than a comprehensive quality assessment.

Overall, while existing works have made significant strides in detecting bus stops or enhancing public transport system interactions, none have focused on providing a comprehensive evaluation of bus stop infrastructure quality. This gap highlights the need for methods that can assess both the accessibility and the broader structural conditions of bus stops.

2.1 Multimodal Large Language Models (MLLMs)

The field of Multimodal Large Language Models (MLLMs) has seen significant advancements, with models designed to process and integrate information from various modalities such as text, images, and audio. These models have the potential to perform tasks requiring a deep understanding of both linguistic and visual information, making them particularly suitable for tasks like analyzing street-level imagery, as seen in this work.

One notable model in this space is LLaVA [9] (Large Language and Vision Assistant), which uses visual instruction tuning to align vision-language understanding. LLaVA-1.5 [7] introduced improvements to multimodal instruction tuning, emphasizing efficient data usage while maintaining strong performance across several benchmark tasks, including visual question answering (VQA) and complex visual reasoning tasks. LLaVA-1.5 showed a notable capability to achieve state-of-the-art performance on 12 benchmark datasets. It highlights the model's effectiveness in handling real-world images and multimodal queries efficiently, using less data than its contemporaries. Despite these improvements, LLaVA-1.5, like many early models, was limited by lower image resolutions and required further fine-tuning for tasks requiring high visual precision. Building on the success of LLaVA-1.5, LLaVA-NeXT[8] introduced further enhancements, including support for higher-resolution images, improved optical character recognition (OCR), and better reasoning capabilities. These advancements allow LLaVA-NeXT to capture finer visual details and demonstrate superior performance in tasks involving detailed visual reasoning, such as object detection, OCR tasks, and complex visual scene analysis.

3 Method

Building on the insights from previous research, this section outlines our approach to assessing the structural quality of bus stops in

São Paulo. We describe the selection of bus stop locations, the collection of street-level imagery, and the use of advanced multimodal models to analyze infrastructure features. Leveraging the INACITY platform² [1], which integrates Google Street View [2] imagery with geographical data, we collected and analyzed bus stop environments efficiently. Together with the visual reasoning capabilities of LLaVA-NeXT, we evaluate key aspects of bus stop infrastructure, including accessibility and surrounding environmental conditions.

3.1 Bus stops

We elected to use bus stop information from our city of São Paulo, Brazil, as provided by city's administration [3]. The city currently has 21367 bus stops and 32 bus terminals, spread over an area of 1523 square kilometers.

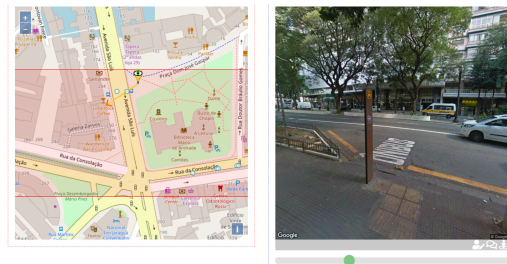


Figure 1: Left: Selection of a region of region of interest in the map, the yellow pin with an arrow denotes the camera position and pose, respectively. Right: The collected image from one bus stop corresponding to the camera position and pose in the map.

Since the city is very large, we opted to select a few sub-regions to study initially, namely important corridors that connect the city center to more residential areas. The regions studied are Avenida Paulista, Rua da Consolação, and Avenida Nove de Julho. These corridors, despite carrying a lot of daily traffic, are reasonably small, having only a few kilometers each, and therefore good candidates for this study.

Another reason for selecting these corridors is the perception that they represent some of the best infrastructure available in the city, since they are among the most used and visible by the public.

Figure 1 shows a selection of bus stops in a region and an image taken for a particular bus stop in that region.

Having collected the images for the bus stops, we used LLaVA-NeXT to describe the bus stops using the following prompts:

- (1) Is there an indication of a bus stop in this image? If the sidewalk is occluded (by a bus for example) say it is occluded.
- (2) What is the kind of the bus stop? It has a roof? Is it just a post? Or there is no physical indication of bus stop?
- (3) How conserved the bus stop physical structure looks like?
- (4) Is there some form of protection from the elements?
- (5) Are there visible street markings?
- (6) Are there potholes in the street?
- (7) Are there potholes in the sidewalk?
- (8) Are there tactile paving in the sidewalk?

²A public instance of the INACITY platform is available at <http://inacity.org/>

(9) Are there wheelchair ramps in the curb?

The first prompt can be used to filter out images where the bus stop might be occluded somehow, and therefore not usable for our purposes.

3.2 Multimodal Large Language Model LLaVa-Next

We selected LLaVA-NeXT for its enhanced capabilities in handling high-resolution images and performing complex visual reasoning. As an open-source model, LLaVA-NeXT provides flexibility for adaptation to specific tasks, such as urban infrastructure assessments, while promoting reproducibility in research.

Building on LLaVA-1.5, LLaVA-NeXT improves visual reasoning and data handling, making it capable of capturing detailed information about both bus stops and their surrounding environment. This ability to process higher-resolution images and more complex contextual information makes it particularly suited for large-scale urban analysis tasks, where fine-grained visual details are critical.

4 Experimental Setup

For this study, we employed LLaVA-NeXT, leveraging the llava-v1.6-vicuna-13b³ pre-trained model for all evaluations of bus stop infrastructure features across the collected street-level images. We used 63 street-level images from bus stops, collected using the INACITY platform.

The experiments were conducted on a high-performance computing environment equipped with an NVIDIA RTX A6000 GPU, 512 GB of RAM, and an Intel(R) Xeon(R) Silver 4310 CPU @ 2.10GHz. The system runs on Ubuntu 22.04.4 LTS, with NVIDIA-SMI 535.183.01, video Driver Version: 535.183.01, and CUDA Version: 12.2. The software environment was built using Python 3.8 and PyTorch 2.2.0.

4.1 Results

Figure 2 shows six images obtained using the proposed method, labeled from a to f, randomly selected from the total of 63 images collected overall. Table 1 shows the summary of the answers provided by the LLM to the prompts submitted alongside the images.

We see that the quality of the answers vary wildly, both across images and prompts. For example, we see that image **a** had the highest number of correct answers (89%), despite having a particular difficult lighting situation. In other cases, such as in image **b**, we see that there is no bus stop at the location, which the LLM identified correctly, but when confronted with the other prompts, the LLM kept answering that there was a bus stop there. Image **e** shows a situation where the LLM failed to detect the bus stop at all.

As for the cases where there was no visible bus stop in the images, we may speculate about the reasons, such as camera pointing in the wrong direction (**b**, **c**, **d**), or possible occlusion (**e**), or less likely, a problem in the city’s geolocation database.

Regarding the prompts, we see that some performed much better than others, with prompt number 5 having the most correct answers, and prompt number 9 having none. This could be attributed to poor

prompt engineering from our part. The full prompts and answers for the example images can be found in Appendix A.

Table 1: Prompts answered correctly per image. Prompts 1-9 (columns) and Images a-f (rows). The number 1 indicates a correctly answered question. Percentage of correct answers is indicated at the margins (last column and last row).

Images	Prompts									%
	1	2	3	4	5	6	7	8	9	
a	1	1	1	1	1	1	1	1	0	0.89
b	1	0	0	0	0	0	0	0	0	0.11
c	0	0	0	0	1	1	1	0	0	0.33
d	1	1	0	0	1	1	1	0	0	0.56
e	0	0	0	0	1	1	1	1	0	0.44
f	1	0	1	0	1	0	0	1	0	0.44
%	0.67	0.33	0.33	0.17	0.83	0.67	0.67	0.50	0.00	

5 Conclusions and Future Work

We presented a method, currently in development, to map physical attributes of bus stops using street level imagery and large language models. We show how the proposed method worked on several example images, and the challenges encountered when evaluating the results.

Currently, the main deficiency seems to lie in the prompt engineering. Future iterations of this method should improve in that area.

6 Acknowledgments

This work was funded partially by FAPESP project 2022/15304-4 and MCTI (law 8.248, PPI-Softex - TIC 13 - 01245.010222/2022-44).

Bio

Artur André Oliveira holds a Ph.D. in Computer Science, specializing in deep learning and computer vision, with a focus on street-level imagery analysis. As a postdoctoral researcher at the University of São Paulo (USP), he applies advanced AI techniques to address urban infrastructure challenges, including detecting trees entangled with power lines using Google Street View imagery.

Mateus Espadoto received his Ph.D. from the University of São Paulo, Brazil, and the University of Groningen, the Netherlands. He has about 25 years of experience in data management and software development. His research interests include computer vision, high-dimensional data visualization and signal processing.

Rafael J. P. Damaceno received his Ph.D. in Computer Science from the Federal University of ABC, Brazil. He has experience in the fields of Human-Computer Interaction and Scientometrics. Since his master’s, he has participated in studies on mobile device accessibility. Currently, he is a postdoctoral researcher at the University of São Paulo, working on Computer Vision and Deep Learning for Urban Informatics.

Roberto Hirata Jr. is Associate Professor of Computer Science at the University of São Paulo. His research, and main contributions, is focused on Computer Vision, Machine Learning and applications,

³The pre-trained model is available at <https://huggingface.co/liuhaotian/llava-v1.6-vicuna-13b>

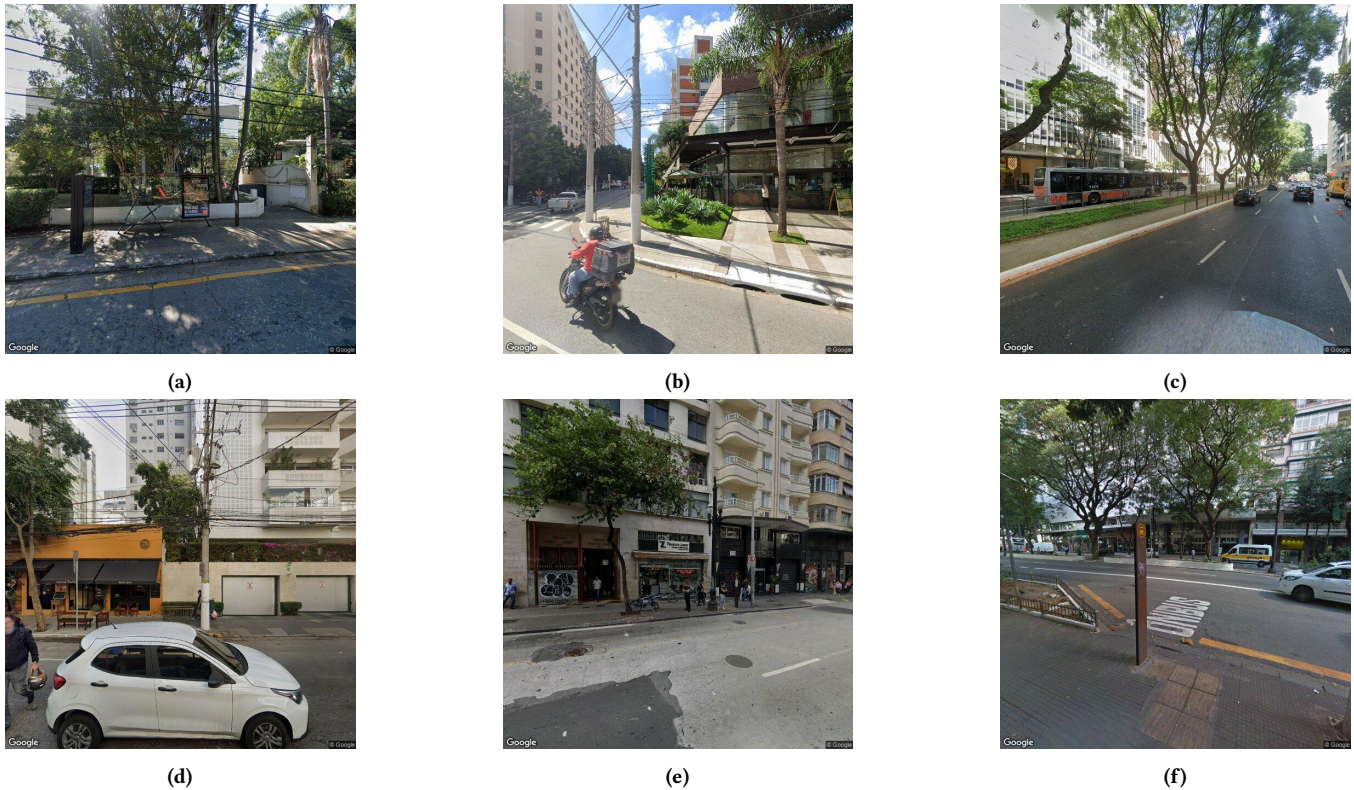


Figure 2: Examples of street level images from bus stops

mainly intelligent cities. He is a principal investigator in a project named Learning Rich Representations in Context for Computer Vision and Chairman of the Postgraduate Committee of the Institute of Mathematics and Statistics.

Roberto M. Cesar Jr. is Full Professor of Computer Science at the University of São Paulo. His research interests include computer vision, pattern recognition, image processing, bioinformatics, and eScience. He has a Ph.D. in Physics and has served as a member of various academic committees and as the director of the eScience Research Center at USP.

Rationale

Bus stops are crucial for ensuring smooth transit and a positive rider experience. Their quality directly influences whether riders feel safe, sheltered, and supported while waiting for transportation. With this project, we aim to contribute to improving this key component of public transit systems, using innovative technology to help cities maintain and prioritize bus stop infrastructure, ultimately benefiting the millions of people who depend on it every day.

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Appendix

A Answers to the Prompts for the Example Images

• Image a:

- (1) Yes, there is an indication of a bus stop in the image. The bus stop is marked by a sign and a bench, which are typical features of a bus stop. The bench is visible on the sidewalk, and the sign is partially obscured by the trees. The sidewalk appears to be clear, and there is no indication of a bus being present at the moment.
- (2) The image shows a bus stop with a simple structure that appears to be a roofed shelter. It is not just a post, as there is a roof providing some shade or protection from the elements. The bus stop is also marked by a sign, which is a physical indication of its purpose. The sign is not clearly visible in the image, but it is typically used to display information about the bus route and schedule.
- (3) The bus stop in the image appears to be relatively well-conserved. It has a clear signage with a bench for passengers to sit while waiting for the bus. The structure is clean and seems to be in good condition, with no visible damage or wear that would indicate it is in disrepair. The surrounding area looks well-maintained as well, with a neat sidewalk and a tree providing shade. The overall impression is that the bus stop is well-kept and functional.
- (4) Yes, there is a structure in the image that appears to provide some protection from the elements. It looks like a small shelter or a covered area, possibly for pedestrians or outdoor seating. The shelter is made of metal and has a roof that extends over the area it's covering. This type of structure is often used to shield people from rain, sun, or other weather conditions.
- (5) Yes, there is a yellow line visible on the street in the image.
- (6) The image shows a street with a yellow line marking the center. However, it's not clear enough to determine if there are pot holes or not. The image quality and angle do not provide a detailed view of the road surface. If you have a specific concern about pot holes or the condition of the street, it would be best to inspect the area in person or with a higher-resolution image.
- (7) The image shows a sidewalk with a few visible cracks and some unevenness, but it doesn't appear to have any significant pot holes. The surface looks relatively smooth, and the sidewalk is lined with trees and a fence.
- (8) Yes, there is tactile paving on the sidewalk in the image. Tactile paving is the textured ground surface indicator that is used to guide visually impaired people to areas of safe crossing at intersections. It is typically composed of a series of small, rounded studs or bumps on the ground surface.
- (9) Yes, there is a wheelchair ramp in the curb.

• Image b:

- (1) The image shows a person riding a motorcycle on a street. There is no clear indication of a bus stop in the image. The sidewalk appears to be clear and not occluded by a bus or any other object. The focus of the image is on the person

riding the motorcycle and the urban environment around them.

- (2) The image shows a bus stop with a roof, which is providing shade for the waiting area. There is a visible roof structure over the waiting area, and it appears to be a designated bus stop with a bench for passengers to sit while they wait for the bus. The presence of the roof and the bench indicates that it is a proper bus stop rather than just a post or no physical indication of a bus stop.
 - (3) The image shows a bus stop with a physical structure that appears to be well-maintained and modern. It has a clean, sleek design with a curved roof that provides shelter for passengers. The bus stop is equipped with seating, and there are no visible signs of damage or disrepair. The area around the bus stop is landscaped with plants and trees, contributing to a pleasant and inviting environment. The overall impression is that the bus stop is well-conserved and cared for.
 - (4) Yes, the person riding the motorcycle is wearing a helmet, which provides some protection from the elements such as wind, dust, and debris. Additionally, the rider is wearing a jacket, which could offer some protection against the weather, depending on the material and design. However, there is no visible form of protection like a windshield or a full-face helmet that would shield the rider from the elements more effectively.
 - (5) Yes, there are visible street markings in the image. There is a crosswalk marked with white lines, and there are also white lines painted on the road, which are typically used to indicate lanes or to separate traffic from other areas of the road.
 - (6) Yes, there is a pot hole in the street visible in the image. It's located near the center of the road, and it appears to be a significant size, which could pose a hazard to vehicles.
 - (7) Yes, there is a pot hole in the sidewalk.
 - (8) Yes, there is tactile paving on the sidewalk in the image. Tactile paving is the textured surface that is usually placed at the beginning of a curb ramp to alert visually impaired people that they are approaching the edge of a sidewalk. It helps guide them safely across the street.
 - (9) Yes, there is a wheelchair ramp in the curb, which is typically designed to provide accessibility for individuals using wheelchairs or other mobility aids.
- #### • Image c:
- (1) Yes, there is an indication of a bus stop in the image. The bus is parked at the curb, which suggests it is at a bus stop. The sidewalk is not fully visible due to the bus being parked, but it appears to be clear of obstructions.
 - (2) The image shows a bus stop that appears to be a simple, unroofed stop. There are no visible physical structures like a roof or a shelter, and no distinct markings or signs that indicate a bus stop. It seems to be a basic, unadorned stop where passengers can wait for the bus. The bus is visible in the background, parked at the curb, which suggests that this is indeed a bus stop.
 - (3) The image shows a bus stop with a shelter structure that appears to be in good condition. It looks well-maintained

and clean, with no visible damage or wear that would suggest it is not well-conserved. The shelter has a roof to provide shade and protection from the elements, and there are seating benches for passengers to wait for the bus. The area around the bus stop is also tidy, with a clear sidewalk and a well-maintained road.

- (4) Yes, the bus in the image appears to have a roof, which provides protection from the elements such as rain or sun for the passengers inside. Additionally, the bus is driving on a street lined with trees, which may offer some shade and protection from the elements for pedestrians and other road users.
- (5) Yes, there are visible street markings in the image. There are white lines painted on the road, which typically indicate lanes for traffic.
- (6) The image shows a street with a bus and several cars. However, it is not possible to determine from this image alone whether there are pot holes in the street. The resolution and angle of the photo do not provide enough detail to confidently identify any potential pot holes. If you have a specific concern about pot holes or road conditions, it would be best to check with local authorities or report any issues directly to them.
- (7) The image shows a street with a bus, cars, and trees. The sidewalk appears to be in good condition with no visible pot holes. However, it's important to note that the image might not capture the entire length of the sidewalk, and there could be pot holes that are not visible in this frame.
- (8) Yes, there is tactile paving on the sidewalk in the image. Tactile paving is the textured ground surface indicator that is used to guide visually impaired people to areas of safe crossing at intersections. It is typically located at the beginning of a curb ramp and is designed to be felt underfoot.
- (9) Yes, there is a wheelchair ramp in the curb, which is a feature that allows wheelchair users to access the sidewalk more easily.

• **Image d:**

- (1) The image shows a street scene with a white car parked on the side of the road. There is no clear indication of a bus stop in this image. The sidewalk appears to be clear and not occluded by any vehicles or objects. There are no visible signs or markings that would typically identify a bus stop. The street is lined with buildings, and there are some pedestrians and a bench visible, but no bus stop is discernible from this perspective.
- (2) The image shows a street scene with a white car parked on the side of the road. There is no visible bus stop with a roof or a designated waiting area in this image. There is a post with a sign, but it is not clear if it is a bus stop sign or another type of sign. The post is located on the sidewalk, and there are no physical indications of a bus stop such as a shelter or a bench. The presence of a bus stop would typically be marked by a sign or a shelter, but in this case, there is no clear indication of a bus stop.
- (3) The image shows a bus stop with a physical structure that appears to be well-maintained. The bus stop sign is

clearly visible, and the shelter structure seems to be in good condition. The area around the bus stop is clean, and there are no visible signs of damage or disrepair. The presence of a person and a car in the image suggests that the bus stop is functional and likely used by the public.

- (4) Yes, there is an umbrella visible in the image, which is being used to provide protection from the elements, likely rain or sun. It is being held by a person who is not fully visible in the frame. The umbrella is providing shade or shelter, depending on the weather conditions at the time the photo was taken.
- (5) Yes, there are visible street markings in the image. The white car is parked on the side of the street, and you can see a white line that indicates the parking area or the edge of the sidewalk. Additionally, there are other markings on the road, which are typically used to guide traffic and indicate lanes or other road features.
- (6) The image shows a street with a white car parked on the side. However, the quality of the street surface is not clear enough to confidently determine if there are pot holes or not. The street appears to be in a city setting with buildings and a sidewalk visible. If you have a specific question about the image or need more details, feel free to ask!
- (7) The image shows a sidewalk with a white car parked on the street. There are no visible pot holes in the sidewalk. The sidewalk appears to be in good condition, and there are no signs of damage or uneven surfaces that would indicate pot holes.
- (8) Yes, there is tactile paving in the sidewalk. Tactile paving is the textured ground surface indicator that is used to guide visually impaired people to a safe area, such as a pedestrian crossing. It is typically located at the beginning of a curb ramp or on the ground surface of a pedestrian crossing.
- (9) Yes, there is a wheelchair ramp in the curb.

• **Image e:**

- (1) The image shows a street scene with a sidewalk and a road. There is no visible bus stop sign or shelter, and the sidewalk is clear of any obstructions. There are no buses or other vehicles that would indicate a bus stop or occlude the sidewalk. The street appears to be a typical urban setting with buildings, trees, and pedestrians.
- (2) The image shows a bus stop with a roof. The roof provides shelter for passengers waiting for the bus. There is a clear physical indication of the bus stop, which is the roof structure. Additionally, there is a sign visible, which is likely to display information about the bus route or schedule. The bus stop is located on the sidewalk next to the street, and there are people standing nearby, possibly waiting for the bus.
- (3) The bus stop in the image appears to be a simple, functional structure with a roof to provide shelter for passengers. It has a metal frame and a roof that seems to be made of corrugated metal or a similar material. The structure is not ornate or particularly decorative; it is designed for practical use. The bus stop is situated on the sidewalk, adjacent

to the road, and there are buildings in the background, suggesting it is in an urban area. The overall condition of the bus stop looks to be in a state of disrepair, with visible rust and wear, indicating it may not have been well-maintained or recently renovated.

- (4) Yes, there is a form of protection from the elements in the image. The buildings have awnings over their entrances, which provide shelter from rain, sun, and other weather conditions for people entering or exiting the buildings. Additionally, there are trees along the sidewalk that offer some shade and protection from the elements.
- (5) Yes, there are visible street markings in the image. There is a white line painted on the road, which is likely a lane marker or a parking restriction line. Additionally, there is a manhole cover in the road, which is a type of street marking that indicates the location of a utility access point.
- (6) Yes, there are pot holes in the street.
- (7) Yes, there are pot holes in the sidewalk.
- (8) Yes, there is tactile paving on the sidewalk in the image. Tactile paving is the textured ground surface indicators that are used to guide visually impaired people to areas of safe crossing at intersections.
- (9) Yes, there is a wheelchair ramp in the curb on the sidewalk.

• **Image f:**

- (1) Yes, there is an indication of a bus stop in the image. The word "BUS" is painted on the road, which typically marks the location of a bus stop. The sidewalk is not occluded by a bus in this image; the bus is parked on the side of the road, and the sidewalk is clear.
- (2) The image shows a bus stop with a roof. The roof is likely there to provide shelter for passengers waiting for the bus. There is also a post with a sign, which is a common feature of bus stops to indicate the stop's name or route information. The bus stop is situated on the sidewalk, adjacent to the road where the bus is parked.
- (3) The bus stop in the image appears to be quite simple and functional. It consists of a signpost with a bus stop sign, which is mounted on a pole. The signpost is likely made of metal or a durable material, and it is designed to be visible to both pedestrians and drivers. The bus stop itself is marked on the pavement with a white "bus stop" label, and there is a yellow line painted on the road to indicate the stop zone for the bus. The structure is minimalistic and seems to be well-maintained, with no visible damage or wear. The area around the bus stop is clean and orderly, with a sidewalk that appears to be in good condition. There are trees and buildings in the background, suggesting that this is an urban or suburban setting. The overall impression is that the bus stop is a basic, functional piece of public infrastructure that is being kept clean and tidy.
- (4) In the image, there is a bus stop with a shelter that provides some protection from the elements, such as rain or sun. The shelter appears to be a simple structure with a roof, but it does not cover the entire waiting area. There are also trees along the sidewalk that might provide some shade. However, the primary protection from the elements for

pedestrians would be the buildings on either side of the street, which offer some shelter from the wind and sun.

- (5) Yes, there are visible street markings in the image. There is a crosswalk with the word "CROSSING" painted on it, and there are also yellow lines indicating a no-parking zone and possibly a bus stop or a loading zone.
- (6) Yes, there are pot holes visible in the street in the image.
- (7) Yes, there are pot holes in the sidewalk.
- (8) Yes, there is tactile paving in the sidewalk. Tactile paving, also known as truncated domes or detectable warnings, is a series of small, rounded, dome-shaped bumps on the ground surface. It is typically used to alert visually impaired people that they are approaching a change in the walking surface, such as a curb or the entrance to a building. The presence of tactile paving in the image suggests that the sidewalk is designed to be accessible and safe for all users, including those with disabilities.
- (9) Yes, there is a wheelchair ramp in the curb, which is designed to provide accessibility for people using wheelchairs or other mobility aids.