



Contactless payments for bikeshare

Market Sounding Results

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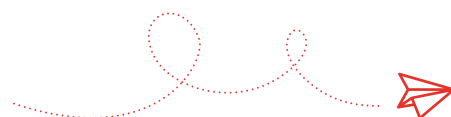
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Disclaimer

This report presents the highlights of the Contactless Payments for Bikeshare Market Sounding ("Market Sounding") process commissioned by the Dutch Ministry of Infrastructure and Water Management in late 2024 and executed by Rebel. To protect the Market Sounding respondents' commercial information, and to encourage candour, the information outlined in this report does not reference specific information about companies or products retrieved from the interviews.

We conducted this Market Sounding by collecting written information and conducting interviews about the knowledge, offerings and capabilities of various market players and industry professionals. The information outlined in this report represents the individual commercial of public views and interests of the respondents of this Market Sounding. This report is intended solely for informational purposes.

Executive Summary

In the Netherlands, bikeshare operators have been active for several years. However, operators face challenges in scaling beyond the major urban areas in a financially sustainable way. Increased convenience by taking away barriers, such as the need to download a specific app, create an account and link a payment method, is expected to attract more users.

In line with the Dutch government's view on integrated mobility for multimodal door-to-door traveling and *Publieke Mobiliteit*, contactless payments present an opportunity to boost the adoption of shared bikes. The widespread adoption of contactless payments in public transit in the Netherlands creates expectations for a similar experience in bikeshare. Research shows that introducing contactless payments in transit can increase ridership up to 10%¹.

On behalf of the Ministry of Infrastructure and Water Management, Rebel engaged with relevant stakeholders in the bikeshare ecosystems to i) discuss the viability and benefits of contactless payments for bikeshare, ii) identify barriers and gaps in implementation, and iii) recommend policy measures to address these barriers. Key stakeholder perspectives included the user perspective; the bikeshare operator perspective; the payment industry perspective; and the authority perspective.

We tested the following five hypotheses with these stakeholders:

1. **The adoption of contactless payments in bike sharing will lead to a substantial net increase of new users and ridership.** In general, this hypothesis was confirmed. Simplifying payments improves user experience, however, specifically bike discovery without an app must be addressed to maximize ridership benefits from contactless payments.
2. **Accepting contactless bank cards to pay for shared bikes will encourage more individuals to create user accounts with the bike share operator.** This hypothesis was not confirmed. Concerns were raised that losing the need for a customer account takes away the ability to provide benefits and discounts alongside questions about legal and financial aspects.
3. **There is a positive business case for bike share providers in accepting contactless payments at the bike.** This hypothesis was not completely confirmed. Since the solution is neither standardized nor widely available, and the profitability is uncertain even though potential benefits are recognized, scale is needed to drive down the costs.
4. **There are no significant barriers preventing a competitive market among bike share operators and their key suppliers.** This hypothesis was confirmed with the remark that no major technical issues were identified, but institutional and regulatory barriers might remain.
5. **The government can act as an accelerator for this innovation, fostering growth and development within the sector.** This hypothesis was confirmed with several additional remarks. Governments are seen as potential market makers or accelerators, but respondents noted slow action on bikeshare due to fragmented organization and lengthy procurement processes. Greater focus on multi-modal integration beyond transit is needed.

Based on our discussions and analysis, we expect that this innovation of contactless payments for bikeshare will continue in the dense urban areas, leaving sub-urban and rural areas behind, both with

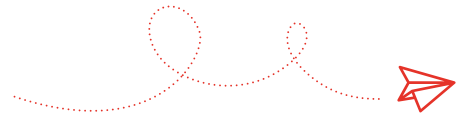
¹ [Visa Economic Empowerment Institute - Reimagining ridership: Open-loop payments and the future of urban mobility](#)

bikeshare in general as well as contactless payments specifically. This is not in line with the Dutch government's policy goal to improve all integrated mobility regardless of the geographical area.

Therefore, it is our advice to set up a demonstration project to work on these issues in a holistic approach. For this the scope of the project is created by the government, taking a strong stand to test different elements for a bikeshare system aligning with public goals; exploring the potential for non-for profit/cooperative bikeshare systems, in sub-urban or rural areas, optimizing bike discovery and wayfinding, testing the distribution of financial incentives via Mobility Wallets to stimulate usage alongside optimizing user experience by implementing contactless payments.

The results of such demonstration project would provide the required input needed to make a thorough feasibility analysis of the costs, benefits, risks, and opportunities for different types of bikeshare systems (docked/free-floating), different types of bikeshare operators (commercial versus cooperative versus public) and areas (urban, sub-urban and rural). This is the basis for a go / no-go decision on scaling the demonstration project approach.

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1. Introduction

Bikeshare systems have been established in the Netherlands for several years, with an estimated 27,000 shared bikes available by 2023. The public transport bike ("OV-fiets") of the Dutch National Railways remains the dominant provider, representing approximately two-thirds of all shared bicycles². In recent years, various market parties have tried to develop shared bicycle systems that can exist alongside the OV-fiets. Many of these operators face challenges in generating sufficient usage, particularly outside major urban areas, which poses a significant risk to the viability of their business models.

The simplicity and convenience of riding a bike directly to one's destination without worrying about traffic, parking, transit schedules or maps is the core value on offering from bikeshare systems, but lengthy registration processes decrease the convenience and simplicity of the system. Research shows that requiring the user to first register and create an account with the provider and only then being able to ride the bike, is a major obstacle for many users³. Users indicate that there are many steps and associated error messages when registering. This makes the registration process seem endless and some users give up in the meantime.

Also, none of the thousands of international visitors in the Netherlands can use OV-fiets because the registration requires a local ID and payment method. It is worrying that currently the registration and payment process is not optimally user-friendly, especially now that more and more governments in the Netherlands are considering investing in shared bicycles as part of public transport ("Publieke Mobiliteit")⁴ which fits the overarching ambition of integrated mobility for multimodal door-to-door travel.

There is a great opportunity to optimize registration and payment if we look at the possibilities that exist today. A potentially promising innovation to significantly improve the user onboarding process is by foregoing the creation of a user account and allowing the user to unlock and pay for a shared bike, using their contactless payment card, mobile wallet or smartwatch ("contactless card"). Two relevant examples should be mentioned here: Freebike offers these services in several European cities⁵ and just recently Donkey Republic and Mastercard announced their collaboration on realizing seamless bike rental in Copenhagen by implementing contactless payments⁶.

The interest in bikeshare as part of one of the various modalities that are needed within the mobility ecosystem is evident. Recent research conducted by the Netherlands Environmental Assessment Agency (*Planbureau voor de Leefomgeving*) shows that the austerity measures scaling down the supply of public transit off-peak and on weekends, have led to reduced accessibility of facilities and jobs in recent years⁷. Specifically in rural areas. Bikeshare, and specifically e-bikes, might provide options for transportation where public transit is limited or not available.

² [CROW - Staat van Deelmobiliteit 2023](#)

³ [Fresk Digital - The state of shared mobility: Bike sharing in 2023](#)

⁴ [Province of Noord-Holland - Province sees opportunities for shared bikes in Gooi and Vechtstreek](#)

⁵ [Freebike.com](#)

⁶ [Mastercard - Mastercard and Donkey Republic partners to enable more sustainable and seamless bike rentals in Copenhagen](#)

⁷ [Netherlands Environmental Assessment Agency - Better accessibility? Changes in access to facilities and jobs in the Netherlands between 2012 and 2022](#)

Additionally, the combination of bikeshare and public transit can also provide attractive alternatives for car trips as stated by the Netherlands Institute for Transport Policy Analysis (*Kennisinstituut voor Mobiliteitsbeleid*)⁸.

The topic of this Market Sounding – Contactless Payments for Bikeshare – fits perfectly with the second and third main directions of the Mobility Vision 2050* (*"Mobiliteitsvisie 2050 Hoofddijnennotitie"*) which is developed by the Dutch Ministry of Infrastructure and Water Management. In this vision the four main directions for 2050 are identified as follows:

1. Pursuing more *integrated goals* that safeguard the public interest of accessibility of socially and economically vital functions throughout the Netherlands.
2. Using, strengthening and connecting various modalities in such a way that the accessibility goals are achieved effectively and efficiently: *the right mobility at the right place and time*. Thus, the Ministry's national focus increasing innovations in mobility and accessibility.
3. The mobility system of the future complies with the *public frameworks* for sustainability, a healthy living environment and safety.
4. The three key items above are being developed on a regional basis, in close cooperation with the administrative partners in which the users of the mobility system are also involved. For freight transport this is a *corridor-oriented approach* that connects to international networks.

* [Ministry of Infrastructure and Water Management - Mobiliteitsvisie 2050 Hoofddijnennotitie](#)

Our assumptions

We have witnessed a tremendous growth of public transport operators that now accept contactless payments with debit and credit cards. In Europe we witnessed implementations in major cities like Rome, Barcelona, London and Stockholm in about 15 countries with a nationwide implementation in the Netherlands. But also in North America, Latin America, Oceania and Asia several implementations took place⁹. We believe that this trend will continue globally. And with this, users will increasingly expect to be able to just pay with their bank card. In the Netherlands, there is a nationwide system where travelers can pay contactless in all busses, trams, trains, and metros, and all these modes accept contactless payments. Therefore, we expect that all riders in the Netherlands will expect the same convenience in other modes of travel like bikeshare. We also expect that reducing the payment barrier for bikeshare could lead to a greater uptake of bikeshare through both an increase in unique users and usage per rider.

The purpose of this Market Sounding

On behalf of the Dutch Ministry of Infrastructure and Water Management, we engaged with a limited set of invited parties to (i) discuss the viability and perceived benefits of this innovation and (ii) identify barriers or gaps to achieve a broad adoption of contactless payments for bikeshare, and (iii) identify

⁸ [Netherlands Institute for Transport Policy Analysis - Combination of bicycle and public transport sometimes an attractive alternative to car](#)

⁹ Rebel Payments, Mobility & Insights research November 2024

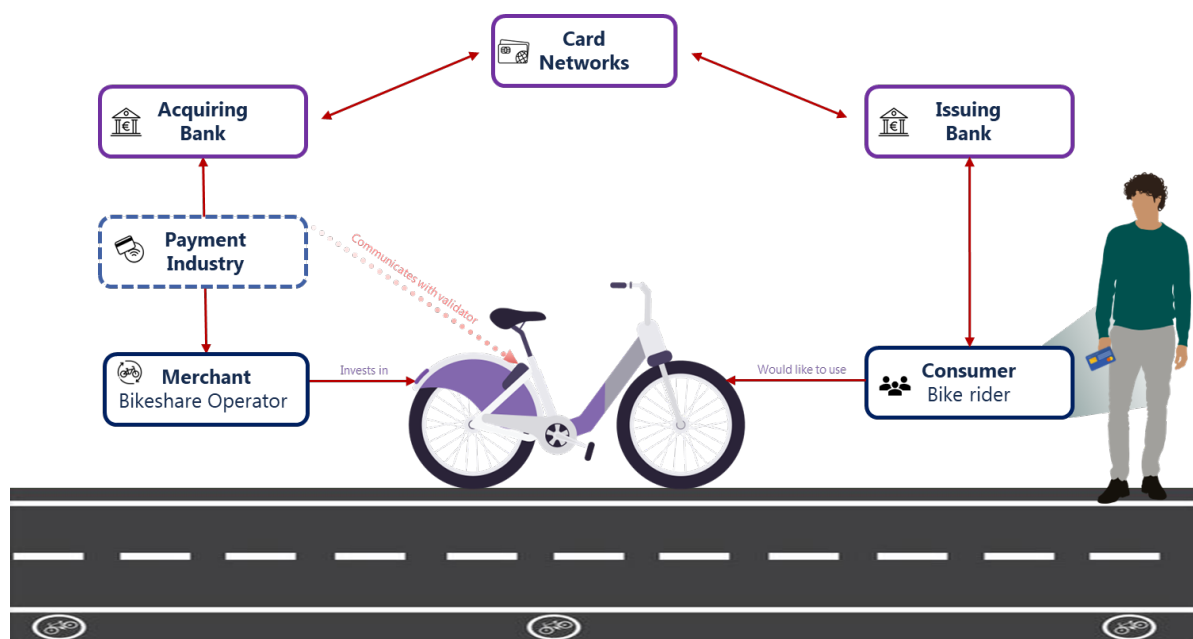
policy measures that the government can take to overcome such barriers. The parties that we selected for this Market Sounding are:

- Several municipalities
- Several bikeshare operators
- Several entities active in the payment's ecosystem

To ensure that all parties could speak freely, we conducted the conversations under the Chatham house rules, providing anonymity for all involved.

2. Concept of contactless payments for bikeshare

To explore the application of contactless payments in shared bike systems, we present an overview of the ecosystem, and the roles of key players involved. The visual below provides a structured depiction of the ecosystem and its stakeholders.



User perspective

Users typically have the option to download an app, create an account with a shared bike or MaaS provider, add payment credentials, and pay using prepaid or postpaid methods. However, there is an expected segment of (potential) users who prefer the simplicity of paying directly with their contactless card, avoiding app downloads or account setups.

The process for contactless card usage, from the user's perspective, can be summarized as follows:

1. Search - The user locates the bike or station, either by spotting it directly, following signage or through a journey planning app.
2. Unlock - The user taps their contactless card on the payment terminal attached to the bike or rack. This action triggers a pre-authorization on the card, confirms the booking, and unlocks

the bike for immediate use if the authorization succeeded. With the bike unlocked, the user can begin the journey without needing to follow additional steps or instructions.

3. Cycle - While cycling and approaching their destination, the user must locate a designated docking station (in station-based systems) or an approved parking spot for free-floating or zone-based bikes. These locations can be identified through clear street signage, a journey planning app displaying (available) parking spots, or features on the shared bike itself, such as a small radar device that guides the user to a nearby parking spot.
4. Lock - Upon completing the trip, a final tap of the contactless card locks the bike, and the trip cost is calculated.
5. Pay - The pre-authorization is either reversed or adjusted to match the trip cost, and the payment is finalized seamlessly.

From the bikeshare operator perspective

Bikeshare operators aim to maximize ridership by offering convenient access, user-friendly systems, and competitive pricing. They use incentives like discounts and rewards to guide user behavior and therefore have an interest in direct marketing targeted at (new) users. To obtain licenses and be allowed to operate in cities and regions, operators align their services with public goals such as preventing nuisance in public spaces.

To implement contactless payments in shared bike systems, operators need to be able to build a sustainable business case. This business case would encompass the following key cost and revenue drivers:

<i>Capital expenditures</i>	<i>Revenues</i>
<ul style="list-style-type: none"> - R&D and initial development and integration costs - Per bike (or rack) payment terminal costs 	<ul style="list-style-type: none"> - More competitive product with contactless payments (temporarily until all providers offer this as well)
<i>Operational expenditures</i>	
<ul style="list-style-type: none"> - Incremental payment processing fees (merchant service charge) - PCI compliance costs - Additional mobile communication costs - Payment terminal maintenance fees - Incremental theft, breakage, and vandalism - Incremental bad debt 	<ul style="list-style-type: none"> - Additional users (incidental / recurring) - Lower user churn (initial users) - Increased usage per user - Potentially lower app development costs

On the cost side, the business case for implementing contactless payments is likely influenced significantly by the total cost of ownership, which includes the purchase, integration, and certification of a payment terminal within a bike equipped with an IoT solution. Merchant service charges will also play a significant role in the operational costs. Additionally, there are some concerns whether tap-to-pay enables new theft pathways because there is no phone number attached and/or users could tap a

prepaid card, get a bike, and then not return it while avoiding any theft charge. While many operators do not charge for bike loss, the viable threat of that charge keeps bike loss minimal. If that threat decreased with tap, then perhaps theft would spike.

On the revenue side, success will depend on the operator's ability to attract additional recurring users and convert a portion of these users into account holders, fostering long-term engagement.

It is important to note that the business case will vary between transit-based long-term rentals like OV-fiets, streetside docked bikeshare systems, and dockless or free-floating bikeshare systems, and may also differ based on the urban, sub-urban, or rural context in which the service operates.

From the payment ecosystem perspective

Unlocking and riding a shared bike with a contactless card relies on several key technological components working in tandem:

1. **Contactless EMV Terminal Integration** - For seamless operations, all racks (in docked systems) and all bikes in free-floating systems must be equipped with contactless EMV payment terminals. While these terminals are widely used in both attended and unattended environments, the market for low-cost devices specifically designed for unattended and mobile applications remains underdeveloped.
2. **Pre-Authorization** - When a user taps their contactless card on the payment terminal, the system authenticates the card and verifies the availability of sufficient funds. This process involves communication between the bike's payment terminal and the payment service provider, like how contactless payment functions in off-street parking systems.
3. **Executing the Payment** - At the end of the ride, when the user locks the bike, the trip cost is finalized, and the fee is charged to the customer's card.

Additionally, in cases of theft or damage, the payment industry players can impose an extra fee on the user to cover the associated costs.

From the authority perspective

Tap-to-pay is of interest to municipalities and public transport authorities because it contributes to public goals via **increased use of sustainable mobility**. Shared bike systems are increasingly encouraged by authorities due to their positive impact on sustainable mobility. If booking and paying for shared bikes can be done with the tap of a contactless card, these users may choose not to take a car, taxi, or shared moped. It is therefore assumed that it is in the interest of the authorities that shared bike systems will start accepting contactless payment cards as soon as possible.

In dense urban areas, where multiple bike share system providers are permitted to operate, authorities typically control supply and quality using (limited) permits or exclusive contracts. Depending on the net financial impact, it's possible that operators would voluntarily adopt contactless payments to offer a better customer experience. If not, the government could still drive adoption by requiring this technology as a permit/contract condition and/or subsidizing its adoption. This might specifically be the case in rural and sub-urban areas.

3. Market Sounding findings

For this Market Sounding we spoke with 10 different market players and industry professionals from both the Netherlands and abroad: bikeshare operators, Dutch municipalities and payment industry players.

The idea that contactless payment is a way of removing a major hurdle for using bikeshare, resonated in general very well with the respondents. Our line of reasoning that, because of the broad adaptation of contactless payments in transportation, users will expect this seamless experience in bikeshare, is supported by all. Specific feedback shed light on key considerations for designing and implementing contactless payments for bikeshare, which is reflected in the description per hypotheses.

1. The adoption of contactless payments in bike sharing will lead to a substantial net increase of new users and ridership.

Explanation of the hypothesis: If users currently want to use a bikeshare system, it is mandatory to create an account and link to a payment method being either the credit card, iDeal, PayPal, direct debit or NS (business)card. For each provider, the user needs to open a separate account. We believe that this is discouraging the occasional potential user of a specific bike share system. Taking away this barrier creates a much more attractive proposition for occasional travellers or visitors/ tourists. For existing customers that do use bikeshare but find themselves in a city with a different operator than their regular one, removing this barrier will increase the uptake.

What we heard from the market: Overall, the responses confirmed that simplifying the payment process will enhance the user experience. Just tapping a card or mobile device on the bike will minimize the steps a user needs to take to require access to the bike, making it more convenient and reducing barriers to use. This ease of access could help attract new users and boost adaptation rates. Specifically, tourists and visitors may benefit the most from this. Although some of the respondents have insights in how much this increase can be, this was not shared due to commercial reasons.

When it comes to the current friction in the process, one of the bikeshare operators mentioned that currently up to 15% of the user who downloaded a bikeshare app, didn't rent a bike. This was expected to be at least partly related to the additional hurdle of creating an account. Multiple respondents also mentioned that multiple international bikeshare operators are already looking into the opportunities for contactless payments on their bikeshare systems. Some respondents mentioned that it might be a good first step to become part of the OVpay ecosystem and be able to unlock and pay for bikes with the future OVpas (successor of the OV-chipcard). This would already be an improvement in offering a more user-friendly experience.

There were a few critical notes made on this hypothesis: one of the respondents called out that just changing the payment method is not the holy grail for increased uptake in ridership, making people familiar with bikeshare concepts is also part of the game. Also, if an app is still required for finding the bike and locking it in the allowed areas (bike discovery), the entry barrier of an app download still exists (though without account creation). A few respondents also stated that they just lacked the knowledge to have a substantiated opinion on this topic.

Conclusions for next steps: The aspect of friction on bike discovery, should be mitigated to grasp the expected benefits on ridership with the implementation of contactless payments. As an example: current policy to organize bikeshare on a hub with standardized designs in the build environment, will

help to overcome the issue of bike discovery. The same applies to integration with wayfinding maps as Google Maps by using standardized GBFS typology.

2. Accepting contactless bank cards to pay for shared bikes will encourage more individuals to create user accounts with the bike share operator.

Explanation of the hypothesis: We believe that being able to do a contactless payment for bike sharing will remove a large barrier to use a shared bike service for the first time. Even though some of these users will inherently be 'limited use' such as tourists, we expect a substantial share of new users to create an account that may offer interesting (cheaper) propositions in a form of e.g. discounts, invoices, monthly or yearly subscriptions. These accounts are of key interest to the bike share providers.

What we heard from the market: This hypothesis is not confirmed by the participants of the Market Sounding. On the contrary, there are several concerns raised that losing the need for a customer account takes away the ability to provide benefits and discounts. Also, a lot of questions were raised on all kinds of legal (e.g. how to manage accepting the terms & conditions prior to the usage of the bike?), and financial aspects (e.g. how can we put fines on users or costs related to vandalism or theft?). The answers to these questions were given from very different perspectives. Some respondents see this as an issue, others mentioned for instance that fines, and other costs are not put on the users since this always leads to discussions where bikeshare operators have a hard time proving that the user is to blame. And given that this is not helpful in a good user experience and their brand in general, bikeshare operators just accept this as their loss. Concerning the legal aspects there were no conclusive answers. Some respondents thought this might be an issue, while others felt less strongly about this.

Conclusions for next steps: Concerning the benefits and discounts, we think this can be mitigated in various ways. One is to make such an attractive offer that users will be willing to create an account with the bikeshare operator after all. Secondly, we see that there are multiple solutions being developed to provide discounts and benefits within a contactless payment system making use of open-loop technology. A few examples: currently discounts for public transit in the Netherlands can already be connected to a bank account using the OVpay app. Internationally we see innovations with Mobility Wallets connected to debit and/ or credit cards to distribute financial rewards, discounts and incentives. Finally, daily/weekly/monthly/annual fare-capping could also be a way to offer volume discounts and replacements to membership or pass programs. When it comes to financial and legal concerns, it is our expectation that those will be solvable similar like the usage of contactless payments in other transportation modes.

3. There is a positive business case for bike share providers in accepting contactless payments at the bike

Explanation of the hypothesis: Given our expectation of increase in users, ridership and accounts, there is a substantial revenue potential. We expect this revenue increase to exceed the increased costs. However, we find it likely that there needs to be scale increase to ensure that payment terminal price goes down and bike share operators add the option to their bikes. We also do not expect a dramatic increase in theft or vandalism compared to the current situation. Users will still feel like they are not

anonymous since they use a bank card that is linked to their identity, unless using a prepaid debit or credit card.

What we heard from the market: This is not completely confirmed by the respondents. While the user appeal of contactless payments is acknowledged widely, there is uncertainty about the profitability: on one hand the solution is not yet a commodity or commercial off-the-shelf widespread available. On the other hand, the potential upsides are understood but not yet clearly quantified although a (expected) substantial uptake of tens of percentages was mentioned. Scale is needed to drive down the costs and broader experience to understand the upside. A concern that was mentioned by some respondents is the potential impact of fraud and unrecoverable debt: many new branchless banks or neobanks offer their customers the ability to create unlimited number of bank accounts and virtual cards. If the bikeshare operator only collects the fee at the end of the trip (or, worse, cost for stealing a bike), the user may already have deleted the account and virtual card, resulting in debt that cannot be recovered without a direct customer relationship.

Conclusions for next steps: The key element here is scale. When making their fleet ready for contactless payments, we expect that bikeshare operators will focus on the dense urban areas where there are a lot of potential additional customers especially travelers and high vehicle utilization. There is also a need for bikeshare specifically in areas where there are not many public transit options (sub-urban and rural). Therefore, we advise considering the impact on public goals like modal shift and access in addition to simply its profitability. Also, smart choices like adding contactless payments on a rack of bikes instead of each individual bike, might serve the business case best and fits very well in the current policies in the Netherlands to organize bikeshare on a hub, specifically in rural areas.

When it comes to fraud associated with contactless payments, solutions developed for the transit use case are available (e.g. having a deny list for specific banks) and will also be applicable for other mobility modes. Alternatively, this can be solved by using the unlock action for a pre-authorization that puts a hold on the user's funds that can always be collected – even if the user deletes the account/card. Additionally, new bike technologies, especially on e-bikes, can remotely lock the drivetrain making vehicle theft less appealing.

4. There are no significant barriers preventing a competitive market among bike share operators and their key suppliers.

Explanation of the hypothesis: The contactless payments ecosystem is an open ecosystem with a global market: payment terminals are a commodity; payment processing and acquiring can be done by multiple parties and every bike share operator can integrate this payment method. This creates the basis for a level playing field and competitive tap-to-pay market.

What we heard from the market: A few respondents responded to this. The market for contactless payment on bikeshare is not yet very mature nor a highly competitive market yet due to the lack of scale. Respondents indicated that there are no structural barriers that prevent a competitive market, such as technological barriers and patents, but these respondents did point towards institutional and regulatory barriers that could be removed. For example, governments lack a unified approach towards payment requirements in tender and permit processes.

A competitive supply-side of the market requires that there is sufficient demand. Some respondents indicated that their willingness to invest in contactless payments would increase if authorities started signalling or communicating their preference or requirements for this payment method early on.

Conclusions for next steps: If municipalities and public authorities want to stimulate the acceptance of frictionless contactless payments for bike share, and ensure that there is a competitive market among bike share operators and their key suppliers, they should consider to jointly signal their wish for contactless payment to the market, and indicate what measures will be taken in upcoming procurements and permit processes to achieve this.

5. The government can act as an accelerator for this innovation, fostering growth and development within the sector.

Explanation of the hypothesis: When creating permit programs, local governments can add requirements, scoring incentives, or subsidies/financing to encourage bike share providers to offer contactless payments as (one of) the preferred payment methods, which may increase the upfront investment costs for the bike share operator. National government can help the local governments by offering guidelines for the requirements and subsidies or financing opportunities by creating a standard approach that can be applied in different use cases.

What we heard from the market: In general, it is acknowledged that governments can play a role as a market maker or accelerator. However, a lot of different additional views were shared. Market Sounding respondents pointed out that governments can be very slow in acting on bikeshare as part of a public transit system because they are all organized in different verticals and slow procurement processes appose significant hurdles in creating scale. Governments should really start thinking about more multi-modal integration, not just transit. Respondents also said that the basics for bikeshare (like preventing nuisance in public space) should be in order first to have a positive public opinion on bikeshare in general. Government subsidies (specifically to help with the cost for investment in contactless payments) might become necessary if profitability is unattainable, like public transportation. This will influence the market. Same was mentioned for specific requirements in permits, this would be beneficial for some bikeshare operators but not for all. The importance of fair and clear policies to ensure sustainable and equitable systems was emphasised along with the need for a more long-term reliable policy view. Some respondents see a role for governments as co-investor of the development costs for contactless payments in bikeshare.

Conclusions for next steps: Government needs to decide whether it wants to intervene. The investment related to this innovation is high and therefore operators would need a clear policy view. This requires a standardized approach between the different (layers of) governments to ensure that bikeshare operators face the same requirements on contactless payments for bikeshare permits. At least at a national level but preferably globally. In the past this has been done. An example of this is how the Mobility as a Service (MaaS) innovation was structured in a nationwide approach with strong collaboration between national and regional government, and private sector operators.

4. Advice and next steps

Based on the discussions we had during the Market Sounding, we conclude that the innovation of implementing contactless payments on bikeshare will most likely continue in the dense urban areas, leaving sub-urban and rural areas behind. This specific focus results in public and private goals not being aligned, since the focus of the Dutch governments is to improve all integrated mobility and

'*Publieke Mobiliteit*' regardless of the geographical region. Specifically in the rural areas there is a reduced accessibility of facilities and jobs in recent years, as we indicated in the introduction of this report. This downward spiral must be stopped and the attractiveness of bikeshare as part of multimodal door to door travel options should be increased. The current mandatory hurdle of downloading an app, creating an account and add payment credentials is an unnecessary step for many potential users. However, while implementing contactless payments for bikeshare there are two key issues as laid out in this report that needs to be solved:

- The **current app dependency** for bike discovery, rewards and incentive purposes, and accepting terms and conditions for bikeshare usage.
- The **uncertain return on investment** and **focus on the most profitable areas** and services by commercially driven bikeshare operators, leaving sub-urban and rural areas behind.

We think that these issues can be mitigated if we would work on the following topics:

- **Current app dependency:**
 - Stimulate integration with wayfinding maps as Google Maps by using standardized GBFS typology.
 - Create standards for physical discovery (current policy on hubs discovery – signage – built environment).
 - Stimulate the innovations with Mobility Wallets connected to debit and/or credit cards to distribute financial rewards, discounts and incentives.
 - Support the further investigation in financial and legal concerns, stimulate the adoption of transit solutions.
- **Uncertain return on investment** and **focus on the most profitable areas:**
 - Options for financial support (OPEX and/or CAPEX) to bikeshare operators, commercial and non-profit/cooperative bikeshare operators.
 - Master agreements, framework agreements and joint procurement to buy hardware and services at national level to achieve scale.
 - Create template requirements on contactless payment options for bikeshare permits

Therefore, it is our advice to set up a demonstration project to work on these issues in a holistic approach. For this the scope of the project is created by the government, taking a strong stand to test different elements for a bikeshare system aligning with public goals; exploring the potential for non-profit/cooperative bikeshare systems, in sub-urban or rural areas, optimizing bike discovery and wayfinding, testing the distribution of financial incentives via Mobility Wallets to stimulate usage alongside optimizing user experience by implementing contactless payments.

The results of the demonstration project will provide the required input needed to make a thorough feasibility analysis of the cost and benefits and risks and opportunities for different types of bikeshare systems (docked/free-floating), different types of bikeshare operators (commercial versus non-profit/cooperative) and areas (urban, sub-urban and rural). This is the basis for a go / no-go decision on scaling the demonstration project approach.

Without the demonstration project we will not be able to collect this data and therefore not able to make objectively supported statements about the real impact of bikeshare and contribution of public goals, including the impact of adding contactless payment as crucial for improving user experience and therefore increase ridership.

We recommend designing the demonstration project according to the following success criteria:

- **Strive for Win-Win-Win scenario:** Bikeshare users, policymakers and bikeshare operators should all benefit from a joint approach:
 - Bikeshare users should gain from seamless access to bikes, both in discovery and paying for the bike, specifically those groups of users who now experience significant hurdles like tourists and infrequent users.
 - Policy makers should get bikeshare solutions that contribute more to the local goals regarding accessibility, liveability, health and safety. Higher ridership numbers will create a bigger impact.
 - Bikeshare operators should be able to limit the risk for the investments that are needed for this innovation.
- **Create a coalition of the willing:** As seen during the Market Sounding there are complex issues to solve. Bringing together a group of parties and people with a strong personal drive to dive into these issues, with the willingness to solve them in a way that is scalable, is essential for success. Include additional knowledge partners like the payment networks and Cycling Industries Europe or NABSA in the United States.
- **Design for scale:** Ensure that standards developed during the demonstration projects can be implemented broadly within the industry with the ability to scale. Not only nationally but also internationally. Don't do pilots that can't scale.
- **Benefits and costs need to be balanced:** All that would benefit from contactless payments should be willing to invest in the innovation:
 - Bikeshare operators – increased ridership
 - Governments – increased impact on policy goals
 - Payment networks – increased usage of debit and credit cards

Next steps

To bring this topic towards decision making regarding a demonstration project, two steps are recommended on the short term:

1. Facilitate the active collection of feedback on the findings of this report.
2. Conduct a global Request for Information (RfI) process including both public and private parties; global payment providers offering contactless payment solutions, bikeshare operators and concessionaires, for the purpose of gaining more insights, as a first step preparing for a process to create a demonstration project.

Acknowledgements

On behalf of the Ministry of Infrastructure and Water management we would like to thank all respondents for their time and valuable insights. The input provides will play a crucial role in shaping the upcoming next steps. When we continue this journey, we plan to engage with parties active in the sector to ensure we stay up to date with global standards, trends and regulations. We are grateful for such continued partnerships and look forward to sharing our learnings.

About Rebel

No change without a Rebel

Rebels work on the issues that affect all our futures, from sustainability, transportation and urban development to healthcare and the social sector. We make an impact, not only as consultants but also as investors. After all, anyone who believes in their own advice should be prepared to invest in it. We are committed to bringing change, initiating and realizing our own projects. We provide quality strategic advice & development, business policy & evaluation, partnership consulting & contracts, financial advice & modelling, and investments & fund management.

Thinking beyond existing structures

The Rebel adventure began in 2002 with ten chairs around a large round table. Sitting around that table, we decided to continue our careers in consultancy by starting our own company – we were the first Rebels. It was to be a company without a hierarchy, without bosses, without limits. A place where everyone could realize their full potential. We bring everything we have inside to the table. Intrinsic motivation, the urge to bring change, expertise and one constant focus: to make a real impact with our projects around the world. We now work with more than 180 Rebels from our offices in Rotterdam, Amsterdam, Antwerp, Düsseldorf, London, Washington D.C., Nairobi, Johannesburg, Mumbai and Jakarta.

The drive and determination of that first step in 2002 informs how we work with and on behalf of our partners to this day. Trust is everything. In everything we do – and we do a lot! – our objective is to have a positive impact on the world. At the interface between the public and the private, because combining social values with a keen business sense is close to the heart of all Rebels. That might seem like an ambitious goal, perhaps, but we have always relished a challenge. We invite everyone to join in, to become part of the change. Let's think beyond existing structures. As governments, as companies and as individuals.

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