Recommended Guidelines and Strategies for Bike Share System Contracting (DRAFT 9/02)

Background:

This document is intended to lead to better contracts. Better contracts will align incentives and will position cities/owners to take advantage of technology enhancements and adapt to business changes. This document is not intended to be a procurement guide. It will describe the aspects of different types of systems relevant to contracting, but will not evaluate competing technologies. On the subject of turnkey procurement versus separate procurement, it is neutral.

The document will use the following terms:

- Terminal: a cabinet containing a self-service point of sale at a bike share station.
- Dock: an assembly designed to hold bike-share bikes uniformly; contains an electronically-controlled locking mechanism.
- Custom rack: a rack designed to hold bike-share bikes uniformly; locking mechanism not included.
- Smart bike: a bike to which an electronically-controlled locking mechanism is mounted.
- Smart bike lock: an assembly mounted on a bike that contains the telecommunications and electronic devices.
- Smart bike system: a system that uses smart bikes and does not use docks, but may use terminals and custom racks.
- Smart dock system: a system that uses docks and terminals.

The following aspects of bike share systems are relevant to contracting:

1) **External Station Components**: External station hardware for urban systems (e.g. plates, docks, map/poster frames, terminal cabinets, custom racks) is typically robust, designed to last 10 years or more in the public right-of-way. Materials used are similar to light poles, parking meters, and other street furniture. Primary replacement parts are generally available only from a single hardware supplier. Cities/owners will desire that expansion equipment look similar to initial procurement and (if portable) fit with existing installation/trucking/storage systems. With a smart bike system, external station components may be substantially reduced.

2) **Electronic Devices (Peripherals)**: Terminals, docks, and smart bike locks contain electronic devices, such as touchpads, key readers, card readers, touchscreens, antennas, modems, etc. There are several reasons these devices impact acquisition cost, operation cost, replacement costs, and customer experience more than other components:

    a. In the smart dock model, each docking point contains multiple electronic devices and docks typically outnumber bikes 2-to-1.

    b. In the smart bike model, electronic components in the smart bike lock are exposed to the same wear and tear that bikes are exposed to.

    c. Many electronic parts have a short lifespan and a rapid technology cycle. A typical touchscreen will fail within 2-5 years. Three-year-old technology is generally obsolete. When we buy replacements, we want current technology.

    d. Over the next five years, we will want to improve our user-interfaces to accommodate new payment systems, integrate with other urban mobility user-interfaces, and offer non-urban solutions. It may be possible to do this without replacing bikes or station hardware, but electronic devices will change.

    e. In a smart dock system, devices must be serviced/replaced by trained technicians. In a smart bike system, it may be possible to return the entire smart bike lock to the vendor for service.

    f. Customers are rarely confused by a flat tire or other bike defect (they just take a different bike). Customers will be confused by dock, terminal, and smart bike lock user-interfaces that fail, resulting in frustration and calls to customer service. In a smart dock system, one defective touchscreen or modem prevents many sales and trips.

    Many devices are purchased "off-the-shelf" from electronic suppliers. Others are custom-built or adapted with custom wiring harnesses or processors. Electronic devices often require special program code, called "firmware". Firmware updates are common to fix bugs and make improvements. Installation of replacement devices often requires upgrade to a new firmware version.

3) **Circuit Boards and Processors**: Terminals, docks, and smart bike locks contain custom circuit boards that connect and control the electronic devices, power system, and telecommunication system. Each terminal and smart bike lock contains a computer on which the operating system is installed. Replacement circuit boards can be obtained only from the back-end suppliers. Circuit boards generally last many years unless damaged by water, contact, or excess voltage.

4) **Back-End Software and Database**: In most cases, bike share systems contract on a "software-as-a-service" basis. The operating system and central data base is hosted on central servers owned or leased by a back-end vendor. Primary components of this agreement are:

a. Software License: gives the system operator rights to use the software and access the data and operating system through a web-based operator's interface.

b. Software Maintenance Agreement: requires the vendor to continuously monitor and upgrade your system to keep all devices running on correct firmware version, repair bugs, and keep software up-to-date with changes required by telecommunications systems, payment gateways, and data-security; generally also entitles customer to receive software upgrades.

c. Hosting Agreements: requires the vendor to host the operating system and data on secure servers.

It is a mistake to think of your back-end as ancillary to your initial equipment purchase decision. You will pay for back-end services on an on-going basis for as long as your system is in operation. The operator's interface will directly impact your ability to provide customer service, to remotely monitor and repair electronic devices, and to configure your products and user-interfaces in response to consumer demand. Like all technology vendors, your software vendor will employ software developers in a continuous cycle of development, a repeated process of (1) identifying priorities for next version, (2) software development, (3) testing, (4) upgrading servers and terminal computers, and (5) debugging. As the person responsible for procuring the best possible system for your city and integrating with your cities' mobility systems, you will want to be involved in the cycle of development.

5) **Bikes and Bike Parts:** From a contracting perspective, bikes and bike parts (excluding smart bike lock components) should be viewed differently than other components of a bike share system. Bikes are consumer products (subject to CPSA testing). The common components we use can be specified for almost any bike at multiple quality levels from multiple manufacturers. Major parts distributors (QBP and J&B) have huge inventories, can deliver to almost any part to any shop in North America in 24 hours, and will provide volume pricing and services (like re-building wheels with bent rims). As bike share systems expand beyond urban areas (where a heavy, "short-trip" bike is optimal) to other areas, we will want options to offer different kinds of bikes to customers. Providing positive bicycling experiences is our core service. If consumer trends change or people in one city prefer one type of bike over another, we need to respond with alternatives.

6) **Local System Operations**: There are seven primary components to local operations:

a. Suitability and service area planning;

b. Site design, engineering, approval, permitting, and maps;

c. Installation and station moving/storage (heavy equipment work);

d. Rebalancing, bike maintenance, general station maintenance;

e. Technical maintenance (electronic components, telecommunications system, etc);

f. Customer service call center;

g. Program/sales/special event services.

After permitting and installation is complete, all of these functions are about training and motivating a local work force to meet expectations for safety, reliability, and customer service. The work is never finished and motivation must be continuous—a system that is perfectly balanced at 3pm might be a mess by 5pm. Because the system is in a continuous state of change, workers must be empowered to work strategically to provide the best experience for customers possible given traffic, usage, weather, and other conditions. When a city contracts with a vendor to perform these functions, the agreement is most similar to a concession agreement. With a smart bike system, local system operations may look slightly different. For instance, it may be possible to reduce local technical maintenance work considerably, assuming the entire smart bike lock can be returned to the manufacturer for repairs. In addition, the municipality may desire an additional set of operating performance specifications to assure that bikes are available in all parts of the service area, bikes are parked in areas that do not interfere with pedestrian routes or unloading activity, and the bikes have an orderly appearance.

7) **Website/Mobile Applications**: For contracting, it is important to understand that your "front-end" (customer facing) website has two kinds of pages, publicly available and password protected.

   a. The website and mobile applications may be provided as a component of the back-end software license and maintenance agreement or separately procured from an operating vendor offering web development services. If the latter approach is used, the web developer utilizes an Application Program Interface ("API") or "web services" protocol published by the back-end vendor to build the secure pages.

   b. Design of the public pages is generally driven by marketing and sponsorship considerations, and should accommodate customization of design and branding, including sponsorships and logos.

   c. The password protected pages are more complicated. They enable customers to create accounts, make payments, and access personal account information. These secure pages are subject to the same data security requirements as your back-end payment system.

8) **Product Configuration (Pricing)/Marketing/Sponsorships:** The strategic development of new ways to price, communicate, and market bike sharing to consumers is the area where the greatest experimentation is occurring now. It is also the area where cities/ owners are retaining the most control. Over the next several years, we expect back-end vendors will compete by providing cities/owners with more options to configure products and user interfaces to meet city-specific goals. Consultants will compete by providing strategic advice to optimize a system to local conditions.

9) **Telecommunications and Payment Processing**: Because there is a SIM card in every station (or on every bike) and we have a high volume of low-price transactions, telecommunications and payment processing are a significant operating costs. These contracts can be set up through the owner, the operator, an integrated product supplier, or a separate back-end vendor. Downtime caused by telecommunication systems failure or payment processing problems have been major causes of lost revenue and customer dissatisfaction in bike share systems. Reducing these costs and eliminating this downtime is an important opportunity for all parties in bike share industry. With a smart bike system, the monthly telecommunications budget may be higher due to the fact that there is a connection on every bicycle.

Recommendations:

1) **The system owner should be a party to the software license, maintenance, and hosting agreement.**

    a. Without a software license, you cannot configure or operate your system. If your local operations supplier or any other supplier fails to perform, you should be able to replace that supplier or take-over the function without losing your license agreement.

2) **To improve transparency and accountability, separate contracts by function.**

    a. Desire for turnkey projects and reliance on form contracts has in some cases resulted in "Frankenstein contracts," in which a software agreement, an equipment supply agreement, and a local operating agreement are integrated with a form contract intended for public construction projects. This contracting approach can limit a city's ability to oversee the contract because it is very difficult for city officials to determine who is responsible for a problem or take action to correct it. Examples:

        i. Station downtime may be caused by poor local maintenance, by lack of replacement parts, by problems with back-end software, or by telecom/ payment processing problems.

        ii. A delay in implementation of new pricing or a data security lapse could be the responsibility of either a back-end vendor or front-end web developers.

    When cities/owners pay a monthly or quarterly lump sum for software license/ maintenance/hosting, telecom/payment gateway, local operating services, and replacement parts, the city/owner loses the ability to separately incentivize software developers, on-street maintenance crews, and bike designers to innovate and achieve city goals.

b. We can separately define deliverables and contract for back-end, station hardware, bikes, and local operations to enhance accountability and achieve goals.

3) **Turnkey procurement can be compatible with transparent and well-aligned contracts.**

    a. To limit "finger-pointing" or to simplify initial procurement, a city/owner may request proposals on a turnkey basis, so that one vendor will be a prime contractor responsible for the bid and may subcontract with other vendors. These guidelines are neutral with regard to turnkey procurement versus separate procurement. In either case, contracts can and should be separated by function.

        i. RFPs should put the burden on vendors to indicate the extent to which their products and services can be integrated with others' equipment, software, and services. Contracts should require vendors to maintain the same or greater level of integration capacity.

        ii. Each prime contract and sub-contract should have performance indicators that are transparent to the system owner, should have a contract term and performance incentives tailored to the function (discussed below), and should be separately terminable in the event of default.

        iii. Subcontracts should contain business continuity clauses to protect the city/owner. (discussed below)

4) **The back-end vendor should have contractual incentives to work with you on the cycle of development and to help you achieve usage and revenue goals.**

    a. Most software-as-a-service agreements will contain a Service Level Agreement. Under the typical SLA, the monthly license/maintenance fee will be reduced if the vendor fails to achieve "uptime" and other performance requirements. While important to set baseline expectations, SLAs do not create the relationship we want, because:

        i. Cities/owners often have no idea whether downtime is caused by a software problem, a telecommunications problem, lack of parts, or local maintenance.

        ii. SLAs have not been calibrated to customer impact. A half-hour downtime at rush hour has a much more negative impact on customers than a four-hour downtime overnight.

        iii. The SLA penalty structure does not create any incentive for developers to collaborate with us to grow sales and usage.

b. If cities/owners are serious about achieving long-term goals, including faster user-interfaces and integration with other modes, we have to contract for it. That will require:

    i. City employees responsible for system oversight must have greater access to view the operator's interfaces and to learn about configuration options so they make informed decisions.

    ii. City employees responsible for system oversight should have a mechanism to contribute to prioritization of development goals.

    iii. Developers should have financial incentives to make upgrades that increase sales and usage. Revenue-sharing or incentives based on a combination of sales and usage growth are effective ways to align long-term incentives.

    iv. To achieve some goals, it may be necessary to enter into a separate software development agreement. Anticipate that you will want both customized upgrades and standardized upgrades in the future and will need a mechanism to pay for customization and address IP rights.

5) Exclusive supply agreements should be avoided unless they create actual cost savings and clauses are included to protect the city/owner.

a. Exclusivity is built-in for some parts (e.g., custom circuit boards) and effective for other parts (customized devices and unique hardware requiring molds and tooling).

b. For off-the-shelf bike parts, hardware, and electronic parts, an exclusive supply agreement can dramatically impair our ability to purchase parts we need through distribution channels that can fill our orders faster, cheaper, and with greater flexibility to make changes and improvements (ie., to buy the next-generation derailleur or touchscreen as a replacement part).

c. The current one-system-one-bike approach is bad for the consumer and bad for the long-term success of bike share. Opening this market up to new bike manufacturers will result in more innovation and new alternatives (like a winter-specific bike). We should open up this market as much as possible so that consumers can ride the best bikes for their city and bikes can change with consumer preferences. Bike share hardware vendors have options to sell locking/bike identification components to bike manufacturers together with a technology license, if applicable.

d. If exclusive supply terms are to be used, then the vendor should agree to terms to protect you from future supply chain failure and make sure you are not buying obsolete spare parts, including: (1) minimum inventory levels, (2) regular publication of a complete parts list with pricing and description, (3) proof of second source, (4) proof that suppliers are being paid on timely basis,

and (5) commitment to supply latest-generation compatible technology for replacement parts.

6) **Local operating agreements should be structured to reward strategic use of resources to maximize positive customer experiences.**

    a. To achieve the level of reliability we want for our customers, we need our operations vendors to use their labor and equipment strategically and to innovate.

    b. A proposed "Reliability Index" will measure actual success in meeting customer demand for bikes and empty docks in each station, taking into account the activity-level at the station and the time of day.

        i. The index should be reported at least daily so that incentives are immediate and operating changes can be implemented quickly in response to poor performance or changing conditions.

        ii. The index should be sufficiently granular to identify the stations and time of day at which the highest number of customers are frustrated by empty and full stations, so that operations resources can be focused there and problems with station density/size can be identified.

    c. Nobody buys a 24-hour pass at an empty station. Because greater reliability at busy stations at busy times will directly result in more trips and more revenue, we should create financial incentives for operators to hit reliability targets on a daily basis.

        i. Incentives should be tied to both usage and reliability (i.e., higher reliability on a busy day should result in greater incentive payment).

    d. Persistent failure to hit reliability goals should result in:

        i. Investment in more operating resources;

        ii. Investment in more bikes and stations in problem areas;

        iii. Downward adjustment of reliability expectations; or

        iv. Change in operator.

7) **Warranties should match materials and contract goals.**

    a. External station hardware should be warranted against paint failure, water leakage, and dust intrusion. Remedies for breach should include local repair.

    b. Warranties on bikes and bike components should match bike industry standards (typically one-year). Using standard terms will broaden the market for bike suppliers.

c. Warranties on electronic components should match the technology development cycle. Where multi-year warranties are used, replacements should be made with the latest generation compatible technology. Cities/ owners should have options to replace failed devices with upgraded devices if they pay for the difference in cost.

8) Contract for business continuity.

a. Bike sharing is a rapidly changing technology industry in a rapidly changing urban mobility sector. Our vendors will continue to realign, grow, and fail.

b. By separating contracts by function, cities/owners will gain understanding of who is supplying what and business continuity vulnerability.

c. Recommended strategies include:

i. Direct software license.

ii. Software escrow agreement.

iii. Control of critical assets/relationships: (1) web domain, (2) call center phone number, (3) trademarks, (4) payment gateway, (5) telecom contracts.

iv. Remedies for failure to supply unique replacement parts.

v. Direct contracts with critical replacement part suppliers.

d. Evaluate each major contract function from a business continuity perspective:

i. If your back-end vendor defaults, you will want to be able to have the latest-version source code delivered to a contractor capable of hosting and running it.

ii. If an exclusive supplier of replacement parts defaults, you will want the ability to access the supply chain directly.

iii. If a local operator defaults, you will want the ability to contract with a new local operator and give them access to the back-end operator's interface.

iv. If bike design is defective or customer needs change, you will want the capacity to purchase compatible bikes from other suppliers.