City of Lowell Parking Department
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Nicholas Navin
Parking Director

MEMORANDUM

TO: Kevin J. Murphy, City Manager

FROM: Nicholas Navin, Parking Director

SUBJECT: Update to Council Motion of 4/25/17 by Councilor Leary:
Request City Manager review the feasibility of creating an application ("App") to determine the availability of parking spaces within the City owned parking garages and public parking on streets.

Since the first report of feasibility this past spring, the Parking Department has been engaged in learning about the various parking occupancy solutions for both on-and-off-street parking. During that span of time the department has met with many vendors and has participated in a pilot program of advanced on-street parking technology to get a tangible sense of the functions and benefits a smart parking solution can deliver. Generally speaking, the costs of these systems are high, and there are an array of pros and cons with each type of solution. Throughout this exercise the Parking Department has worked collaboratively with other departments to see if there are ways to pool resources and initiatives to deliver an improved parking and wayfinding experience, which may be opportunities worth exploring.

Initially, two scenarios were considered: publishing occupancy for our off-street parking facilities, and incorporating a wayfinding component to available on-street parking spaces, with both sets of information being delivered by way of smartphone application, or app. Having explored the available solutions in the industry, it became clear there are many ways to meet these ends with varying degrees of accuracy and complexity. In general, as accuracy of the system increased, so did cost. Another factor to consider as it pertains to cost is that the additional features achieved with these technology improvements introduces overhead and operating costs with little increased revenue potential; in other words, we would be adding considerable operating costs for an improved parking experience that would result in little, if any, additional revenue. The following page contains a matrix of possible on and off street solutions with observed pros and cons.

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On-Street Solutions	Pros	Cons
• Municipal Parking Services Sentry Meters (product that was piloted on Merrimack Street)	• No up front costs • Turn-key solution with full a full suite of parking conveniences enabled by mobile apps • Vastly reduced monthly reoccurring maintenance and upkeep costs • High level of accuracy and service • Big data analytics • Advertising and commerce opportunities for local merchants	• 50% revenue sharing for all on-street parking revenue for a minimum of ten years • Tremendous increase in parking citations initially • Need for increased department staff to accomodate addtional citation volume and collections • Reliance on smartphone app for wayfinding can potentially lead to distracted driving
• Integrated third party solution	• Delivers smart parking and wayfinding initatives with good accuracy in most cases • Greatest revenue potential if fully and successfully implemented	• Millions in up-front installation and integration costs • Increased monthly maintenance, upkeep, and operational costs • Need for increased staff and enforcement technologies to yeild the highest accuracy and performance of the system • Reliance on smartphone app for wayfinding can potentially lead to distracted driving

Garage Solutions	Pros	Cons
• Count gate lifts/loop detection at garage entrance/exit • Install cameras with image dectection capabilities at garage entrance/exit	• Least expensive solution • Fairly easy to integrate into existing parking access technology • Occupancy info can be pushed to an app or a variable-message sign	• Least accurate solution • Does not provide available spaces by floor, only facility totals • Does not account for vehicles that enter and take two spaces • Difficult to differentiate between transient or monthly parking availability
• Basic solution (above) plus smart sensors on every floor and wayfinding signage	• Can be integrated with existing parking access technology • Can display accurate floor-by-floor space availability in real time • Can implement software extentions for both clients and operations • Additional aspect of public safety by way of camera coverage	• Costly solution - cameras, software, connectivity and maintenance costs • Hundreds of thousands per garage in installation costs

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Throughout the research of these parking solutions and with interdepartmental collaboration other opportunities to improve wayfinding, parking accessibility, and traffic congestion has emerged and should be considered. Chief among these, and a fundamental aspect to all of the above solutions, is an improved communications infrastructure. This is currently underway in a small scale with the Merrimack and Central Street roadway improvements, and lays an important foundation for future intelligent transportation and variable messaging systems that can be leveraged to display parking and wayfinding information. Recently, the City Engineer's Office and MIS have been focused on incorporating this communications framework into roadway projects, and over time our parking system can be a great beneficiary from this effort. Moving forward, we should consider as a top priority to cooperate and make resources available to catalyze this endeavor of new communications infrastructure, which will lay the foundation to implement any of the above options in the future. In addition to creating a built environment conducive to implementing these parking technologies, a whole systems design can be of great benefit to several departments and initiatives such as improved traffic flow and public safety. Another low-tech and immediate wayfinding improvement that can be made is through improved signage identifying off-street parking resources. Recently the Parking Department procured and installed new wayfinding signage to the garages at key intersections, and is collaborating with the City Engineer's Office and DPD to improve other signage within the downtown to identify parking resources in relation to venues and institutions within the downtown.

In conclusion, many of the parking technologies to improve wayfinding and circulation are very expensive with an array of pros and cons. These endeavors would no doubt improve the parking experience, but under the current conditions and parking rates it would be very difficult if not impossible to afford at this time. To continue making progress to this end, we should consider investing collaboratively with other departments into the communications infrastructure downtown so that we can be poised to make these improvements in the future.