

Stonier Graduate School of Banking

Analysis and Recommendation for QNB's Real Time Business Payments Program

Capstone Project

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Executive Summary

Businesses want real-time payments and they are ready for them now. Is QNB? Over the last handful of years real-time payment options have quickly become a consumer expectation in our society where 24X7 service and availability are demanded. Consumers have quickly adopted use of digital solutions to move money fast and are processing a significant number of transactions through these channels as illustrated by Zelle, who processed 828 million transactions totaling \$226 Billion in the first six months of 2021.¹ Business owners who are using these payment solutions from the consumer side are noticing that they do not have the same type of experience in their legacy payments solutions and are joining consumers in stepping up their use of mobile banking and digital payments solutions. Businesses are beginning to see the potential value in using real-time payments to solve various day to day challenges and in providing faster service to their customers and employees. Research suggests that “more than half (56%) of small and medium-sized businesses believe that using immediate payment platforms would boost revenues”² and that by 2025, 30% to 50% of business-to-business payments will be done in real time.³

QNB presently offers our business customers various payment solutions, yet none of them are real-time and require forethought and planning to ensure they reach the intended

¹ Tim Ruhe and Sarah Grotta, The PaymentsJournal.com, “The World Wants Real-Time Payments, And They Want Them Now.” *Payments Journal*, posted January 20, 2022, <https://www.paymentsjournal.com/the-world-wants-real-time-payments-and-they-want-them-now/> (accessed February 7, 2022). (Ruhe, 2022)

² PYMTS.com, “Today in B2B: B2B Payments Getting More Real by 2025; SMBs Make More Money with Immediate Payments,” *News & Trends B2B Payments*, posted October 26, 2021 <https://www.pymnts.com/news/b2b-payments/2021/today-in-b2b-payments-getting-more-real-by-2025/> (accessed November 3, 2021). (PYMTS.com, 2021)

³ Ginny Chappell, FIS Senior Vice President of Digital Payments. PYMTS.com, “Today in B2B: B2B Payments Getting More Real by 2025; SMBs Make More Money with Immediate Payments,” *News & Trends B2B Payments*, posted October 26, 2021 <https://www.pymnts.com/news/b2b-payments/2021/today-in-b2b-payments-getting-more-real-by-2025/> (accessed November 3, 2021). (Chappell, 2021)

recipient on time. QNB Bank operates in a very competitive market and some direct competitors are already offering real-time payment solutions. This capstone analyzes implementation of a real-time payments solution for business use at QNB.

Presently, The Clearing House's RTP Network (TCH RTP) is the only real-time payments network in the United States with The Federal Reserve's FedNow solution anticipated to launch in 2023. Costs for implementation of TCH RTP are anticipated to be \$33,150 with some variation in monthly cost related to system access and assuming a five-year contract term. Implementation is anticipated to take approximately nine months and require commitment from various areas of the organization to be successful.

54% of QNB's business customer base already use online and/or mobile banking and generate over 11,000 electronic payments of various types per month. Based on the research conducted and using an estimate of 15% of these payments migrating to real-time with a \$1.95 per transaction fee assessed, QNB could see annual revenue growth along with anticipated transaction growth and an overall positive return on the investment.

Based upon the analysis and research, it is recommended that QNB move forward with implementing a real-time payments solution, however, because this analysis and research is based on available details for TCH RTP, it is recommended to analyze the final pricing and implementation requirements more carefully for the FedNow solution before finalizing *which* solution is the best fit for QNB.

Implementing a real-time payments solution shows business customers that QNB is committed to their needs, expectations, and their success while providing a potential source of ongoing revenue.

Introduction and Background

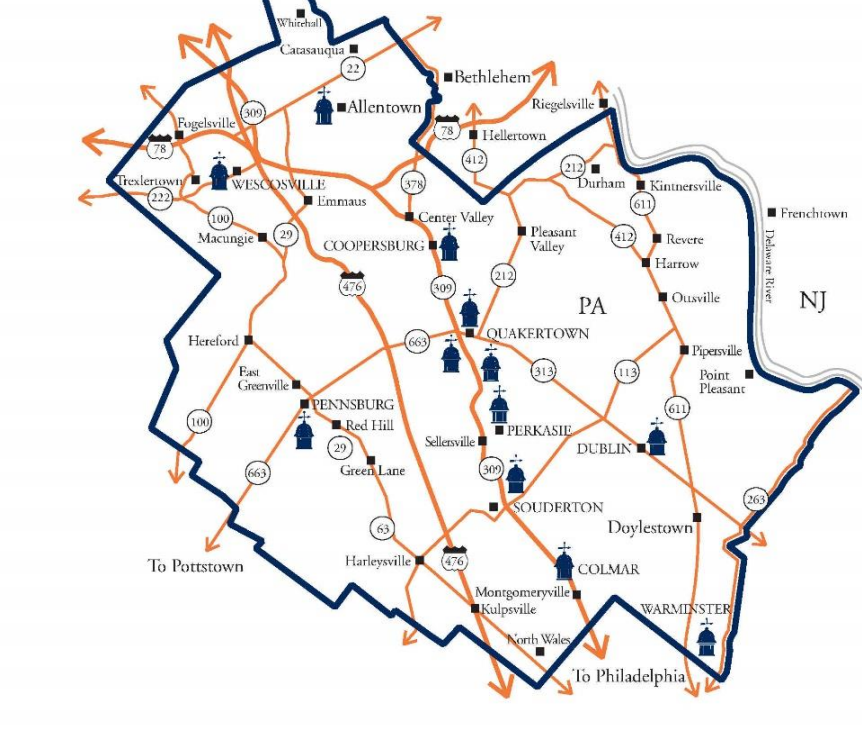
QNB Bank

QNB Bank (the “Bank”) is an independent state chartered, community bank with a current asset size of \$1.5 billion, presently operating 12 full-service branches serving the communities of Bucks, Lehigh, and Montgomery counties in Pennsylvania.

The Bank was originally established in 1877 as a nationally chartered bank in Quakertown, Pennsylvania, under the name of The Quakertown National Bank. The Bank employed strategies to foster slow and steady growth into other communities with a network consisting of eight branches by the end of 2007, including one full-service supermarket branch with extended hours. However, the Bank’s growth was somewhat suppressed by being thought of as a Quakertown bank to potential customers in areas outside of Quakertown.

On December 28, 2007, the Bank rebranded as a state-chartered bank under the name of QNB Bank (“QNB”) as a strategy to assist in achieving ongoing growth goals outside of Quakertown and into closely surrounding market areas. Since the rebranding, four additional branches have been opened providing expansion of QNB’s market further north into Allentown and Wescosville and further south into Colmar and Warminster as shown in Figure 1.

Illustration of QNB Branches and Outlined Market Area (Figure 1):



QNB provides a full range of commercial, retail and investment management services to customers in the communities served. The mission of QNB is to operate in an environment in which:

- Our Customers always come first and perceive the Bank as a trusted resource in achieving their financial goals.
- Our Employees can achieve personal and professional success.
- Our Shareholders receive the rewards of ownership; and
- Our Communities benefit from our Corporate Citizenship.

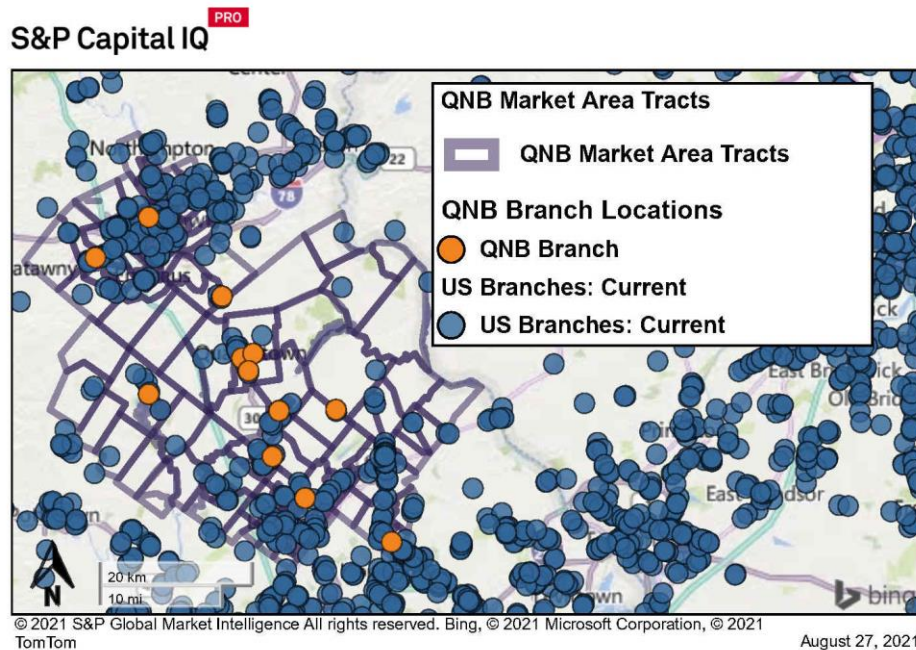
QNB's strategies in support of the mission are:

- To remain a strong, independent community bank committed to its shareholders, customers, employees, and the communities in which it does business.
- QNB will follow a policy of growth within the counties of Bucks, Montgomery, Lehigh, and Northampton to achieve financial goals of 3% increase in deposits and 10% increase in loans.
- QNB will focus on building full banking relationships with its customers through excellent personalized service.

Reaching these strategic goals and continuing to remain relevant presents a challenge due to the intense competition in the market areas served. As of June 30, 2020, QNB's defined market area was banked by a total of 48 other varied types of financial institutions served by a total of 222 branch locations as illustrated in Figure 2. ⁴

⁴ Brian Schaffer, QNB Marketing Director, *Market Share Report*, June 30, 2020. (Schaffer, Market Share Report, 2020)

QNB Bank Market Area Tracts and Surrounding Branches (Figure 2):



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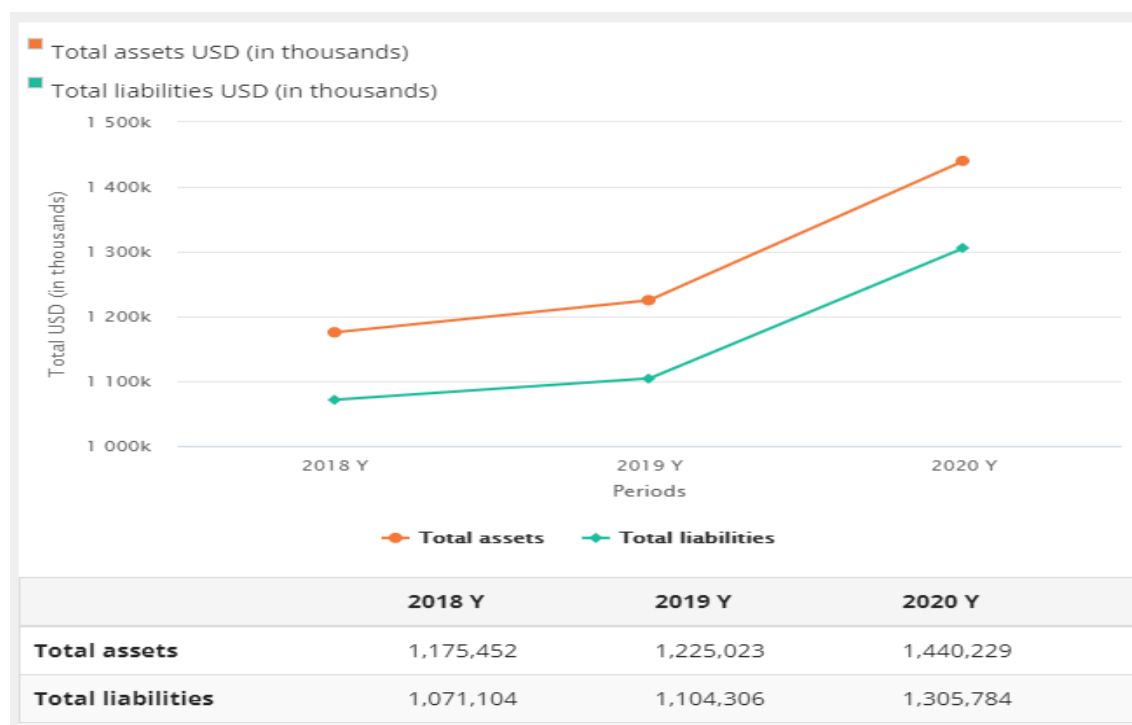
As of June 30, 2020, QNB ranked overall 7th with 5% market share within this defined market area.⁶ QNB has seen household, core deposit and loan growth due in part to market disruption created by bank mergers in its footprint throughout 2018, 2019 and 2020. This contributed to an overall increase in liabilities of \$201,478, or 18.2%, to \$1,305,784 in 2020, which follows an increase of \$33,202, or 3.10%, to \$1,104,306 in 2019 (Figure 3). This growth also contributed to an overall increase in assets of \$215,206, or 17.6%, to \$1,440,229 in 2020, which follows an increase of \$49,571, or 4.2%, to \$1,225,023 in 2019 (Figure 3). QNB ended 2020 with net income of \$12,083, as compared to \$12,357 in 2019 and \$11,335 in 2018 (Figure 4). The net income dip in 2020 was primarily due to less contribution of income from the holding company as a result of decrease in gains and fair market value of the equity portfolio vs. the

⁵ S&P Global Market Intelligence, *S&P Capital IQ*, August 27, 2021 (S&P Capital IQ, 2021)

⁶ Schaffer, 2 (Schaffer, Market Share Report, 2020)

Bank. This was also impacted by a decrease in overall loan demand due to the COVID 19 pandemic.⁷

2018-2020 Total Assets and Liabilities (Figure 3):

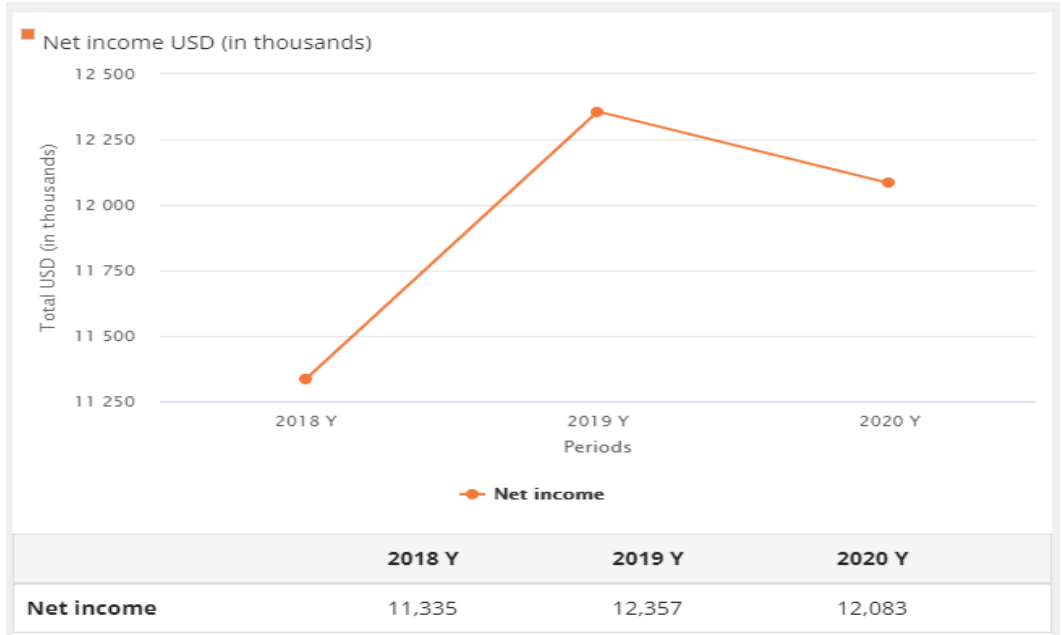


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⁷ QNB Bank, *QNB Corp. 2020 Annual Report Making a Difference, Going the Distance*, April 1, 2021 (QNB Bank, 2021)

⁸ QNB Bank.com, Investor Relations “As Reported Charting” <https://ir.qnbbank.com/financial-information/as-reported-charting/default.aspx> (accessed Oct 1, 2021) (Investor Relations, 2021)

2018-2020 Net Income (Figure 4):



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QNB’s ability to succeed in a competitive market area and achieve our growth goals, requires that QNB have relevant products and services that support our customers which meet their lending, deposit and payments processing needs. QNB has various strategic initiatives to support this growth, two of which are relevant to business customers and payments: 1) a Business Banking initiative that focusses attention on those often-ignored smaller customers¹⁰ that often blossom into long-time loyal and high performing QNB relationships, 2) a Payments initiative that focusses attention on various solutions to support payment processing needs.

Current Payment Processing Solutions

⁹ QNBBank.com Investor Relations, 5 (Investor Relations, 2021)

¹⁰ QNB defines small business customers managed by the Business Banking group as commercial relationships with lending needs of \$500,000 or less and/or sales of \$10 million dollars or less. Scott Orzechoski, EVP Chief Lending Officer. (Orzechoski, 2021)

QNB presently has various technologies that provide payment processing solutions for businesses, which include the following:

- Online and mobile banking funds transfers between internal QNB accounts
- Bill payment, facilitated through online and mobile banking, provides the ability to make payments to individuals and other businesses, in addition to transferring funds between QNB accounts and external financial institution accounts
- ACH origination of credits (payroll, accounts payable payments, etc.), facilitated through either online and mobile banking or via secure file transfer, with a requirement to originate two days prior to the effective entry date.¹¹
- ACH origination of debits (collections, accounts receivables, etc.), facilitated through either online and mobile banking or via secure file transfer, with a requirement to originate one day prior to the effective entry date.⁵
- Wire transfers, facilitated through either online and mobile banking or via phone or fax.
- Debit Card transactions, which include the ability to withdrawal cash and make purchases

As of August 23, 2021, QNB has 53,332 retail deposit accounts and 6,671 business deposit accounts.¹² Approximately 54% of these business deposit account customers are currently utilizing online and/or mobile banking¹³ generating, on average, over 36,000

¹¹ Nacha, *2021 Nacha Operating Rules & Guidelines*, define effective entry date as the date the Originator intends for the entries to post to the accounts of the Receivers. (NACHA, 2021)

¹² Brian Schaffer, QNB Marketing Director, *Retail and Business Product Totals Report*, August 27, 2021 (Schaffer, *Retail and Business Product Totals Report*, 2021)

¹³ Brian Schaffer, QNB Marketing Director, *Business by Account – Online and Mobile*, August 31, 2021 (Schaffer, *Business by Account - Online and Mobile*, 2021)

transactions for \$130 million.¹⁴ Approximately 25% of these business deposit accounts have a debit card performing, on average, \$2.25 million of debit card purchase transactions.¹⁵

QNB’s present payments processing solutions require forethought and planning from the business to ensure the transaction reaches the recipient within the desired timeframe as illustrated in Figure 5. ACH origination credits require submission of the transaction two business days prior to the effective entry date. ACH origination credits require submission of the transaction one business day prior to the effective entry date. Bill payment transactions may require anywhere from two to ten business days prior to the payment due date depending on whether the payment can be sent electronically to the recipient or if it must be sent by check.

Figure 5

Payment Solution Type	Time Frame to Reach Recipient
Online & Mobile Banking funds transfers between internal QNB Accounts	Immediate if completed and approved on a business day before the 9:00 PM ET cutoff
Bill Payment created as check transaction	Generally, up to 10 business days depending on US Postal service delivery
Bill Payment created as electronic transaction	Generally, up to 2-3 business days
Bill Payment funds transfers between QNB account and external account	Generally, 2-3 business days
ACH Credit Origination (payroll, accounts payable payments, etc.)	2 days if completed and approved on a business day before the 4:00 PM ET cutoff
ACH Debit Origination (collections, accounts receivable, etc.)	1 day if completed and approved on a business day before the 4:00 PM ET cutoff
Wire Transfers	Same day if completed and approved on a business day before the 3:00 PM ET cutoff time for domestic wires
Debit Card Transactions	Immediate once approved through the card processor and card network

¹⁴ OLB, *QNB Online Monthly Statistics Report*, September 1, 2021

¹⁵ CBS Card Processing Solutions, *CPS Cardholder Monthly Statistics Report*, September 1, 2021

Change in Payments Technology

With the anticipation of changes to the payment's ecosystem in the next 3-5 years and options that may migrate transactions away from ACH and/or wires toward other real-time payments solutions, QNB's payments initiatives must continue to evolve to not only meet our business customers ongoing payments needs, but to ensure payments can be done in such a way that will be efficient and extremely timely. Businesses are not only going to want but expect real-time payments as they are already clearly seeing the benefits this can provide as a consumer when using solutions like Zelle, Venmo and PayPal for person- to-person (P2P) payments. "They are now comparing their businesses' slow legacy payment methods with the real-time transactions enabled by P2P apps." ¹⁶

QNB's strongest competitors relative to business banking today are Wells Fargo, Univest, TD Bank, Truist and Key Bank. With the exception of Key Bank, each of these banks has a larger market share presence than QNB and all have multiple branches within QNB's current market area. Presently, all of these banks, with exception of Univest, already has a real-time payments solution available to business customers.

Therefore, it will be imperative that QNB plan to implement a real-time payments solution to compete for, and remain relevant to, businesses in our markets where competitors already have technologies to speed the payments process and get funds in the hands of a business or a payment recipient more quickly.

¹⁶ PYMNTS.com, "Deep Dive: How Real-Time Payments Can Help Meet B2B, P2P Expectations," *Real-Time Payments Report*, posted November 27, 2020, <https://www.pymnts.com/news/faster-payments/2020/deep-dive-how-real-time-payments-can-help-meet-b2b-p2p-expectations/> (accessed August 31, 2021). (PYMNTS.com, 2020)

Strategy/Implementation

What are Real-Time Payments?

Real-time payments are payments that are initiated and settled instantaneously. They are supported by digital infrastructure on payment networks that provide 24x7x365 access. It is important to understand that the terms “real-time payments” and “faster payments” are not interchangeable. While often referred to as the same thing, they are not. There are similarities, such as speed of payment, but also differences, such as slower settlement, which means that funds have not moved from financial institution to financial institution, thus not making them final and potentially subject to reversal. For example, faster payments solutions, such as NACHA’s Same Day ACH, do post and settle faster than traditional payment rails, but not instantaneously, and Mastercard’s and Visa’s push payment solutions, will post a transaction within seconds or minutes, but they do not settle quickly. As a result, neither of these is considered a real-time payments solution.

Real-time payments have the following attributes that provide business benefits and solve some business challenges:

- Elimination of lag time on receiving, settling, and finality of payments, all of which provide better financial control, liquidity and risk management surrounding payments. In addition to being instantaneous, once a real-time payment is received, it is settled and, therefore, it cannot be taken back or reclaimed by the sender because it requires the sender to have sufficient funds in their account before they can send the payment.

- Rich, flexible messaging functionality (including those that meet international standards to help ensure global interoperability). End to end, bilateral communication is supported within the single transaction between the payer and payee. Historically, data related to a payment has only been one-way, or required to be done outside of the payments system altogether, making it challenging for a business to quickly connect payments in a relevant way to their records.
- Safety and security as real-time payments solutions include various supporting fraud monitoring utilities to assist in spotting suspected fraud, therefore assisting in overall payments certainty by the receiver.

How Does a Real-Time Payment Work?

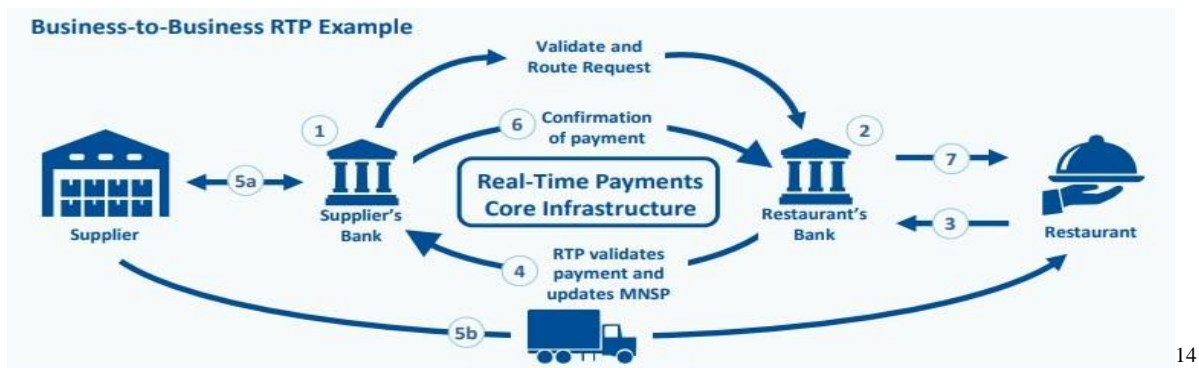
Presently, The Clearing House's RTP Network is the only real-time payments network in the United States with The Federal Reserve's FedNow solution anticipated to launch in 2023. Both solutions follow a similar standard real-time payment flow which consists of the following steps as outlined and illustrated in Figure 6 below. The entire payment, supporting payment information, and payment settlement flows within seconds.

1. The supplier sends a request for payment to its bank.
2. The supplier's bank validates and routes the request for payment to the buyer's bank over the real-time payments network.
3. The buyer sends the payment to its bank.
4. The real-time payments network validates the buyer's payment and updates the multilateral-net settlement.

5. The real-time payments network sends the payment to the supplier's bank, who then pays the supplier, who then credits the supplier's account. The supplier provides ordered goods to the buyer.

6. Confirmation of the payment is provided back to the buyer's bank.¹⁷

Figure 6



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Instantaneous settlement of funds related to a real-time payment are handled through established clearing accounts. Both real-time payments solutions provide various reporting to assist the Bank in reviewing transaction funds flow and net settlement. FedNow is also planning to provide a Liquidity Management Tool (LMT) to assist in supporting efficient liquidity management in a 24x7x365 environment.

Business Use Cases

Real-time payments have a number of applicable business case uses for Business to Business (B2B) payments, payroll, request for payment (RfP) and more. Some examples include:

¹⁷ USBank.com, "Real-time payments: the next major treasury disruptor" published July 1, 2021, <https://www.usbank.com/financialiq/improve-your-operations/manage-payments/real-time-payments-the-next-major-treasury-disruptor.html> (accessed October 1, 2021) (USBank.com, 2021)

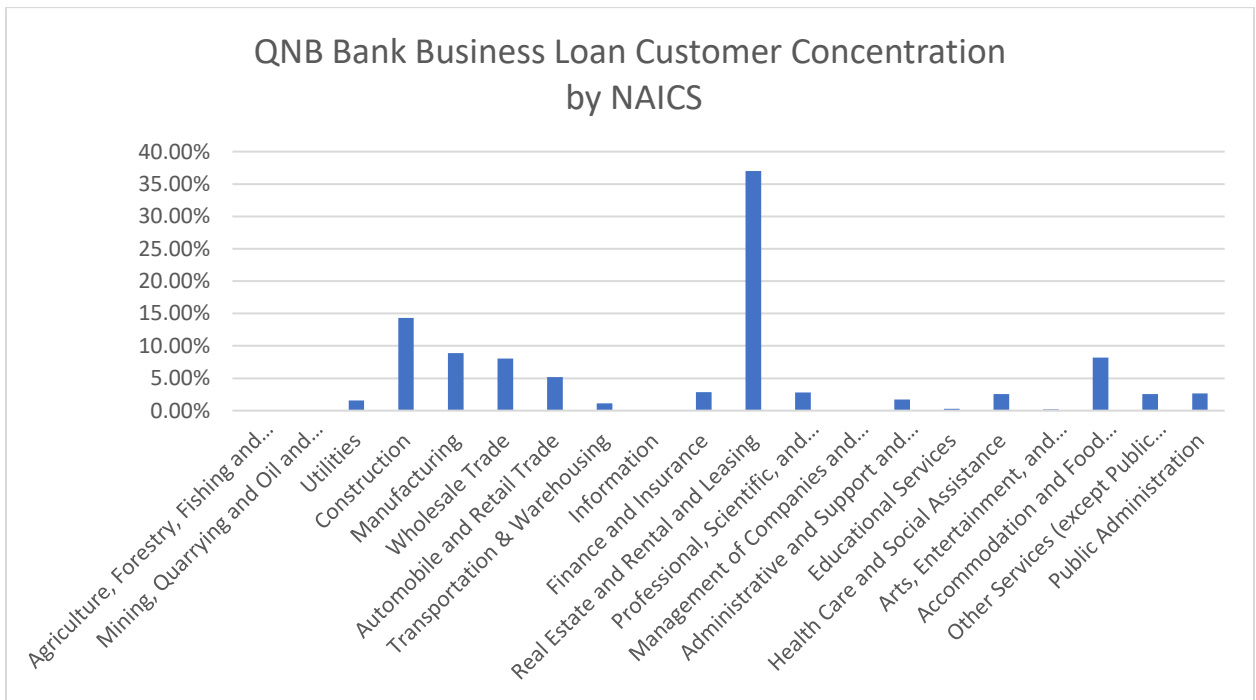
- Small business merchants receiving real-time payments from sales, increases their cash on hand and possibly reduce their need to borrow.
- Contractors or manufacturers can more quickly obtain materials by sending real-time payment to suppliers that require payment in advance of shipment.
- Insurance providers can send real-time payments for claims to businesses or consumers that are impacted by natural disasters.
- Businesses can pay employees quickly, including employee reimbursements for business related expenses for those that may be doing business related travel.
- Real Estate, rental, utility companies, manufacturers, or other suppliers can send customers a RfP and receive the funds immediately once the customer authorizes the payment, which is easily linked to the original payment request for more streamlined and automated recordkeeping.
- Hotels or restaurants utilizing merchant real-time point of sale solutions enable them to collect on purchases instantaneously providing better cash flow.

QNB presently has highest concentrations of business loan customers within the real estate, rental, and leasing, followed by construction, manufacturing, hotel and food, merchant wholesale trades and retails which is illustrated in Figure 7 below. All of these customers are in industries where their business payments activities would benefit from real-time payments as indicated above. Not providing such payment solutions could result in loss of these customers to other financial institutions that are able to support a real-time payment offering. QNB will need to review the existing business customer base to determine their current and future interest in utilization of real-time payments as compared to current payment processing solutions and their wiliness to pay for such services. To assist with this, QNB will create a real-time payments

project team that will engage in investigating competition, create customer surveys and/or focus groups, create a marketing and training plan for both QNB customer contact personnel and business customers.

It is anticipated that even reduced interest today will result in increased interest in the future due to customer changes in behavior and expectations and increased understanding of the benefits derived by real-time payments.

Figure 7



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¹⁸ Cheryl Morris, QNB Bank SVP Chief Credit Officer, *2nd Qtr 2021 NAICS Concentrations Report*, July 2021 (Morris, 2021)

Opportunities and Benefits

Real-time payments provide a way to satisfy evolving customer demands in the ever-increasing expectation of immediacy in this digital age. Implementing such a solution offers QNB opportunities for innovation and new revenue streams while meeting needs and expectations of our business customers. Esther George, President and CEO of the Federal Reserve Bank of Kansas City cited Fed research that discovered “each year there are 29 billion payments for which real-time or near real-time delivery would be desirable to end-users. One-third of consumers and three-fourths of businesses want real-time payments, and they are willing to pay for them.”¹⁹

As more businesses seek out options for real-time payments based on the benefits they can provide, this may result in cannibalism of some existing transactions performed using ACH or wire services which could result in reduction of fee income to QNB from these transaction streams. While there is anticipation that customers will continue to utilize a variety of payment solutions and that every transaction does not require immediate posting and availability, the ever-increasing appetite for digital channels and real-time payments requires careful consideration of the impact such a shift would potentially cause. It is expected that the use of real-time payments, especially for business use cases, will only continue to rise moving into the future. Therefore, implementing a real-time payments solution would be important to replace and enhance revenue opportunities.

In addition, QNB would derive the following benefits:

¹⁹CBS.com, “Same-Day ACH Updates”, CBS News & *Success Stories*. Originally published at (http://pages.CBS.com/sl_news_success) however, no longer available (accessed June 2020)

- The ability to offer additional value-added products and services to our customers
- Providing better customer service to our customers leading to improved loyalty and greater potential to obtain and retain a full banking relationship
- Demonstrating that QNB is innovative and able to support current payment trends

Not implementing a real-time payments solution at QNB, means we risk losing existing revenue streams and customer relationships. If we cannot support our customer needs as a community financial institution, there will be fintech firms or other financial institutions just waiting to fulfill customer needs related to improved payments solutions. Therefore, implementation of a real-time payment solution at QNB is both an offensive and defensive strategy.

Solutions Available and Implementation Considerations

Presently, The Clearing House's RTP Network (TCH RTP) is the only operational real-time payments network in the United States. The Federal Reserve's FedNow solution is anticipated to launch in 2023. Any solution considered by QNB must integrate seamlessly with our supported core banking solution (CBS) because this is planned to be our core banking solution for the next seven years.

CBS provides integration to TCH RTP via their proprietary faster payment hub, CBS PayCenter. The high availability infrastructure leveraged by CBS PayCenter provides seamless connection to TCH RTP and, in the future, planned connection to FedNow. Utilizing CBS PayCenter reduces the overall resources necessary for connection to these solutions due to the ready-built infrastructure which can ultimately expedite time-to-market, provide onboarding expertise, ongoing support, and assistance in reducing inherent operational risks.

Additional considerations for implementation include:

- Solution review and selection – While the TCH RTP solution is presently the only solution available, FedNow will be available shortly. QNB must evaluate the pros and cons of both solutions to determine which is the best fit for our organization and overall payments strategy.
- Product management - Analyzing the QNB customer base, their needs and pain points must be done to understand which of customers may benefit first from a real-time payments solution and, as a result, what products should be created, modified, and marketed to support the solution to potential early adopters and then future rollout to remaining customers. This can be accomplished by creating a customer focus group made up of various existing customers from some of the business segments that can potentially benefit from this payment solution.
- Risk management –Corporate account takeover is a specific type of cyber-crime often targeted as small and medium sized business customers. NACHA defines corporate account takeover as “when cyber-thieves gain control of a business’ bank account by stealing the business’ valid online banking credentials.”²⁰ This type of cyber-crime can pose a significant risk in potential loss to a customer who may be unaware that credentials to access their online banking, or other business banking solutions, have been stolen until funds are already gone. Because real-time payment transactions clear and settle immediately and are final, there are no reversals, making it imperative that customers are clearly educated on the risks

²⁰ NACHA <https://www.nacha.org/news/corporate-account-takeovers-can-lead-fraudulent-transactions> titled “Corporate Account Takeovers Can Lead to Fraudulent Transactions” posted on December 2, 2009, accessed January 4, 2022. (NACHA, 2009)

and impact of corporate account takeover and measures they can take to help prevent this before suffering any potential financial loss.

In addition to good customer education surrounding the risks and prevention of corporate account takeover, any real-time payments solution requires review of any “built-in” solutions or analytics to assist in spotting and managing fraud and minimizing potential loss to QNB and customers. For example, the TCH RTP solution is strictly a “credit push” solution, the person making the payment is the one instructing the financial institution to make the payment, therefore reducing certain types of fraud. Transactions have a maximum of \$100,000 with the financial institution having the ability to provide reduced limits to customers utilizing the solution based on risk management criteria. Real-time payment transactions clear and settle immediately and are final, so there are no reversals or NSF's. The FedNow solution is being built utilizing a fraud review module to assist in spotting potentially fraudulent transactions before they are sent.

- Compliance – Both TCH RTP and FedNow are supported by specific operating rules of the payment solution and how it will be implemented to ensure consistency and compliance. Both incorporate criteria identified by the Federal Reserve sponsored Faster Payments Task Force. Reviewing solutions to determine and understand applicable rules is imperative to ensure management of compliance risk.
- Operations – Various operational tasks require review and possible modification.
 - Daily settlement procedures must be reviewed and modified to include obtaining and utilizing new and different reporting sources to aid in the

fully understand the timing on transaction settlement and its impact in overall bank cash position.

- Transaction flow and posting, systems processing, and funds availability will be impacted by changes to acceptance of real-time transactions due to the 24x7x365 posting. This will have implications related to overdraft processing, transaction authorization and ensuring such transactions are properly displayed in online and mobile banking.
- Customer enrollment in real-time payments creation may require establishing agreements, an approval process that may require underwriting review for risk analysis, and procedures for back-office enablement of the solution for the customer.
- Customer experience and support – Ensuring any new solution offered to QNB customers is backed by the ability for bank staff to support it in a manner that is consistent with QNB’s personalized service will be important. Both customers and employees will require training to manage the overall customer experience from initial enrollment, through and including, ongoing use of real-time transaction payment solutions. Implementing a solution that is user friendly to generate, receive and track data related to real-time payments is imperative to managing the customer service experience.

Implementation Timeline

Understanding the timeline required for implementation of a real time payments solution is required in order to plan ahead and ensure QNB is ready to deliver the solution based on the

desired payments strategy. QNB anticipates that this will take approximately nine months from time of initial vendor engagement to live launch of general availability.

Presently, TCH RTP is available via integration with our CBS. The portion of the implementation, once a contract is initiated through CBS, requires 60 days. Providing the ability for customers to access and initiate a real time payment transaction via online banking with single sign on link to the RTP solution also requires engagement with QNB's online and mobile banking provider. Such project plans generally require approximately six months lead time for scheduling and 60 days for implementation and testing once the project has begun.

During the overall project timeline, QNB will need to review and prepare for the many additional considerations for implementation as previously discussed. These steps are an important part of implementation timeline and should not be rushed. These efforts are estimated to occur over the nine months of the overall project, running in conjunction with other parts of the vendor implementation timeline as illustrated in Figure 8.

Lastly, testing must be conducted before launching for general availability. Testing is recommended to be completed with a small number of customers willing to function as beta. This is anticipated to be 20-30 days to ensure adequate ability to review impact of transactions from initiation through posting and final settlement.

Figure 8

Real-Time Payments High Level Implementation Plan Timeline																																						
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
Core Banking Solution																																						
Contact initiated	█																																					
Kickoff Call		█																																				
Installation packet completed			█																																			
RTP agreement signed				█																																		
CBS signed (if applicable)					█																																	
CBS RTP Account setup						█																																
TCH Portal access (if applicable)							█																															
TCH Portal review (if applicable)								█																														
Logo Setup (optional)									█																													
Internal User Acceptance Testing										█																												
Online Banking Solution																																						
Engage OLB	█																																					
Complete and sign OLB SOW		█																																				
Slotting & Programming																																						
Implementation																																						
Internal User Acceptance Testing																																						
QNB Project Team																																						
Assemble QNB Project Team	█																																					
QNB Operational Review & Prep																																						
QNB Compliance Review & Prep																																						
QNB Customer Review & Contacts																																						
Create Marketing Plan																																						
Create Training Plan																																						
Conduct staff training																																						
Beta training and testing																																						
Go live general availability																																						

FedNow is due to be released for availability in 2023. While the Federal Reserve has not yet released details on an implementation timeline, speculation is that the implementation of FedNow within the CBS and OLB for online and mobile banking solutions will require the same implementation timeline as TCH RTP. Based on prior experience of implementation of solutions through the Federal Reserve, speculation is that the implementation timeline is 30 days.

Financial Impact

Implementation Costs

Implementation of the CBS PayCenter is required to support integration of a real-time payment solution within the CBS regardless of whether the solution implemented utilizes TCH RTP or the future FedNow solution. The initial cost to implement TCH RTP is anticipated to be \$33,650, which may be slightly reduced as it contains varied monthly costs depending on the number of bank users requiring portal access. Cost estimates assume of QNB entering into a five-year contract regardless of which real-time payment solution is selected. As part of implementation planning and overall analysis, QNB should determine whether this is the

appropriate contract length. While a shorter contract term may be beneficial based on rapid changes in technology, this tends to increase initial costs, so careful analysis is needed to determine the right balance between the ability to make quick changes and the cost associated to be able to do so.

The breakdown between one-time fees and monthly fees for the first year is \$16,250 and \$17,400 respectively, however, if spreading the one-time implementation fees over the life of the contract, this makes the total yearly cost \$21,050. These costs include assumptions of anticipated one-time implementation and monthly costs assessed by OLB for online and mobile banking single sign on access.

The costs to implement FedNow are anticipated to be the same for CBS integration and online and mobile banking single sign on access. Variation is anticipated in the monthly costs assessed by the Federal Reserve for access to this solution. It is anticipated that Fed will price the solution in a similar manner to current ACH processing participation and settlement services and, as a result, this will slightly increase the overall cost of the solution above TCH RTP.

Figure 9 illustrates the breakdown of costs among the different solutions:

Figure 9

TCH RTP Solution Implementation Costs²¹

Item	Quantity	Price Per	Cost	Frequency
CBS Pay Cener	1	\$6,500.00	\$6,500.00	One-time
RTP Implementation (receive)	1	\$2,000.00	\$2,000.00	One-time
RTP Monthly Network	1	\$850.00	\$850.00	Monthly
RTP Implementation (send)	1	\$2,750.00	\$2,750.00	One-time
CBS PayCenter Portal Access (includes 2 users), per additional user	2	\$50.00	\$100.00	Monthly
OLB Professional Services	1	\$5,000.00	\$5,000.00	One-time
OLB RTP Single Sign On	1	\$500.00	\$500.00	Monthly
Total One-Time Implementation Fees			\$16,250.00	
Total Monthly Fees			\$1,450.00	
Monthly Fees Annualized			\$17,400.00	
First Year Cost - Implementation Plus Monthly Fees			\$33,650.00	
Yearly Cost - Monthly Fees Plus Implementation Fees Annualized Over Life of Contract			\$21,050.00	

FedNow Solution Implementation Costs²²

Item	Quantity	Price Per	Cost	Frequency
CBS PayCenter	1	\$6,500.00	\$6,500.00	One-time
FedNow Implementation (receive)	1	\$2,000.00	\$2,000.00	One-time
FedNow Monthly Network	1	\$850.00	\$850.00	Monthly
FedNow Network Participation and Settlement Services	1	\$120.00	\$120.00	Monthly
FedNow Implementation (send)	1	\$2,750.00	\$2,750.00	One-time
CBS PayCenter Portal Access (includes 2 users), per additional user	2	\$50.00	\$100.00	Monthly
OLB Professional Services	1	\$5,000.00	\$5,000.00	One-time
OLB FedNow Single Sign On	1	\$500.00	\$500.00	Monthly
Total One-Time Implementation Fees			\$16,250.00	
Total Monthly Fees			\$1,570.00	
Monthly Fees Annualized			\$19,340.00	
First Year Cost - Implementation Plus Monthly Fees			\$35,090.00	
Yearly Cost - Monthly Fees Plus Implementation Fees Annualized Over Life of Contract			\$22,400.00	

²¹ CBS., *Proposal for CBS PayCenter and RTP*, February 8, 2021.)

²² CBS., *Proposal for CBS PayCenter and RTP*, February 8, 2021, and Federal Reserve Bank Services, *Statement of Service Charges*, October 2021. (Federal Reserve Bank, 2021)

The assumptions of one-time and monthly costs for Online Banking System (OLB) to support access to RTP via online banking are based on similar types of projects undertaken with this vendor throughout the history of QNB’s relationship with them and current monthly fees paid for other solutions with similar single sign on access.

The assumptions of monthly costs for the FedNow solution are based on similar pricing for current monthly fees paid to the Federal Reserve for other supported services.

Revenue and Return on Investment Estimations

New research suggests that “more than half (56%) of small and medium-sized businesses believe that using immediate payment platforms would boost revenues”²³ and that by 2025, 30% to 50% of business-to-business payments will be done in real time.²⁴ If we consider QNB’s current 6,671 business checking accounts that currently generate an average of 10,000 ACH transactions, 435 wire transactions, and 1,400 bill payments per month respectively, and use these assumptions to predict that 15% of these current payments solutions migrate toward real-time payments annually starting in 2023 and with an additional 2% growth annually through 2025, assuming an estimated cost of \$1.95 per transaction, Figure 10 illustrated the impact on transaction specific revenue and expenses.

²³ PYMNTS.com, “Today in B2B: B2B Payments Getting More Real by 2025; SMBs Make More Money with Immediate Payments,” *News & Trends B2B Payments*, posted October 26, 2021 [Today in B2B: Real-Time Payments Growth by 2025 | PYMNTS.com](#) (accessed November 3, 2021).

²⁴ Ginny Chappell, FIS Senior Vice President of Digital Payments. PYMNTS.com, “Today in B2B: B2B Payments Getting More Real by 2025; SMBs Make More Money with Immediate Payments,” *News & Trends B2B Payments*, posted October 26, 2021 [Today in B2B: Real-Time Payments Growth by 2025 | PYMNTS.com](#) (accessed November 3, 2021).

Figure 10

Current Transaction Volumes						
Transaction Type	Number of Transactions	QNB Expense	Total Expense	Customer Charge	Total Income	NET
ACH	10000	\$ 0.005	\$ 50.000	\$ 0.15	\$ 1,500.00	
Incoming Wire	173	\$ 0.970	\$ 167.810	\$ 10.00	\$ 1,730.00	
Outgoing Wire	262	\$ 0.970	\$ 254.140	\$ 20.00	\$ 5,240.00	
Bill Pay Check	322	\$ 0.650	\$ 209.300	\$ -	\$ -	
Bill Pay Electronic	1078	\$ 0.170	\$ 183.260	\$ -	\$ -	
	11835		\$ 864.510		\$ 8,470.00	\$ 7,605.49
Future Transaction Volume Estimations 2023						
Transaction Type	Number of Transactions	QNB Expense	Total Expense	Customer Charge	Total Income	
ACH	8500	\$ 0.005	\$ 42.500	\$ 0.15	\$ 1,275.00	
Incoming Wire	147	\$ 0.970	\$ 142.590	\$ 10.00	\$ 1,470.00	
Outgoing Wire	223	\$ 0.970	\$ 216.310	\$ 20.00	\$ 4,460.00	
Bill Pay Check	274	\$ 0.650	\$ 178.100	\$ -	\$ -	
Bill Pay Electronic	916	\$ 0.170	\$ 155.720	\$ -	\$ -	
Real-time payments	1775	\$ 0.120	\$ 213.000	\$ 1.95	\$ 3,461.25	
	11835		\$ 948.220		\$ 10,666.25	\$ 9,718.03
				Total Current Monthly Net Income		\$7,605.49
				2023 Total Future Monthly Net Income		\$9,718.03
Future Net Income Estimations Including 2% Growth Annually						
				2024	\$9,912.39	
				2025	\$10,110.64	

The real-time payments per transaction fee in the prior illustration is based on the costs paid by QNB per real-time payments transaction in the CBS PayCenter RTP proposal, current ACH and wire transaction fees assessed to QNB by the Federal Reserve, and current bill payment transaction fees assessed to QNB by CBS’s bill payment solution with additional upcharge to the customer. These assumptions may vary depending on the cost the business customer is willing to pay for each transaction.

Per transaction fee pricing carries risk if not handled accurately. If the initial pricing is too low this can prevent the bank from returning a profit, or even breaking even on the investment, specifically if unable to cover the static monthly costs associated. Low initial fee pricing can also make it difficult to increase too quickly after launching a new service due to

possible negative customer service impact and damage QNB's reputation with the customers it serves.

Conversely, if the initial pricing is too high, this can prevent customers from utilizing the service or seeking out the service from an alternative financial institution willing to provide it at a much lower cost.

In order to manage this risk, it will be important to utilize customer feedback, via those participating in a possible QNB focus group, and review of competition to determine a more accurate per transaction fee that can be assessed for business real-time transactions at time of launch.

Considering the benefits that real-time payments provide to the various business account types that make up the QNB customer base, it is anticipated that they will be willing to pay a per transaction fee once they understand the ways in which real-time payments can be used the benefits derived.

The additional \$25,350.48 in projected annualized income and annualized yearly expenses of \$21,050 related to real-time payments results in a year one return on investment of 1.20%. The ROI continues to increase in years two and three with an estimation of 2% growth in transactions, including those processed as real-time payments as illustrated in Figure 11.

Figure 11

RETURN ON INVESTMENT	2023	2024	2025
Total Future Monthly Net Income	\$9,718.03	\$9,912.39	\$10,110.64
Less Current Monthly Net Income	\$7,605.49	\$7,757.59	\$7,912.74
Increase in Net Income	\$2,112.54	\$2,154.80	\$2,197.90
Increase in Net Income Annualized	\$25,350.48	\$25,857.60	\$26,374.80
Yearly Cost Annualized Over Life of Contract	\$21,050.00	\$21,050.00	\$21,050.00
ROI	1.20	1.23	1.25

Not only would implementing a real-time payment solution offer QNB opportunities to continue to support business customer needs and expectations, but the return on the investment demonstrates this as a new revenue stream with the potential to continue to grow over time. Not implementing such a solution at QNB, means we risk losing this new revenue stream, but also potentially risk losing current revenue streams and customer relationships. If business customers opt to move to other financial institutions that will support this type of payment service, they may also perform their other payments through these financial institutions, thus continuing to erode current transaction volume and revenue derived from these transactions at QNB. As illustrated by the return on investment that QNB can derive over time in Figure 11, implementing a real-time payment solution would be a sound financial decision.

Non-Financial Impact

Organizational Impacts and Hurdles

An investment to implement a real-time payments solution does not just have financial impact, but also significant operational and customer impact, as well as impact on internal resources to oversee the project related to the implementation. These can present significant

organizational hurdles to not only successful implementation and roll-out, but to ongoing customer support and ultimately QNB reputation if not managed appropriately. The solutions to overcoming some of these hurdles may also have actual financial impact depending on how they must be addressed and or implemented.

Operational impacts and hurdles include the following:

- **Settlement and Liquidity Management** - Various back-office processes require review and modification as it relates to settlement and liquidity management. Staff members will need to be trained to potentially use new liquidity management tools and new reporting software to assist in managing balances that will become more complex in a 24x7x365 environment. Decisions and processes will need to be implemented as it relates how and when balances will be monitored or controlled during non-standard business hours. Such decisions could have broad impact on staffing resources and modifications to staff hours and/or processes performed in a remote environment to potentially expand staff availability to perform these tasks.

QNB will need to include the staff members involved in this process in both the decision-making process, and also the planning and training in order to overcome hurdles in this area for successful implementation.

- **Compliance** – Any real-time payment solution requires review and understanding of applicable banking, network, and transaction rules to ensure proper compliance. This not only impacts initial design and rollout of the real-time payment solution, but ongoing posting and support of transactions,

handling of customer inquiries, creation of a proper legal agreement and the process surrounding ongoing customer risk review and enrollment.

Non-compliance could subject QNB to substantial fines and negative customer reputation. Situations of ongoing non-compliance can result in increased regulatory scrutiny and compliance actions. QNB will ensure that staff responsible for payments solutions maintain ongoing subscriptions to various compliance related resources and publications to remain informed of compliance related changes in this area. Payment solutions compliance issues will be a regular topic of discussion at quarterly QNB compliance meetings facilitated by the Compliance Officer.

All customer agreements will be reviewed by QNB legal counsel to ensure compliance with applicable laws and to assist with overall risk management.

- Internal Resources – The overall anticipated nine-month project implementation timeline will require engagement from a number of QNB staff resources from various areas of the organization. Time commitments from staff resources will vary, but any project of this scope has an impact on the ability for these staff members to work on other tasks and projects. This is an important impact to the organization that must be considered when doing overall planning for other potential projects and strategic initiatives to ensure enough resources are available and can be allocated accordingly.

As part of the project planning and creating of ongoing procedures, consideration must be taken to the ongoing staff resources that may be needed to support real-time payments. QNB must consider that such support includes

customer training, enrollment, modifications, troubleshooting, as well as a review of staff support hours. Will customers have an expectation to be able to reach support 24x7x365 to assist with payment related questions or issues? QNB will seek the feedback of the customer focus group to ask this very question and determine expectations. After obtaining feedback, QNB will conduct a review of current staffing levels to determine if additional staff resources are required to adequately support this payment solution. This may require hiring additional support staff or determining how and where to reallocate staff, if necessary.

- Product Management –Customer feedback through a focus group will be sought as part of the initial project implementation, however, ongoing customer feedback will continue to be required to ensure QNB’s solution is meeting customer evolving needs. Investigation may lead to a determination that initial rollout of a real-time payments solution only requires credit send and not a request to receive payments, however, as customers become very familiar such payment streams, they may begin to demand expanded options that will include the requirement to add request for payment capabilities.

The Federal Reserve states, “If your customers aren’t telling you what they want, their behavior might give you a clue.”²⁵ Therefore, QNB will not only need to continue to seek customer feedback but must also utilize various reporting tools to monitor customer transaction behavior.

²⁵ The Federal Reserve, “FedNow Instant Payments, Preplanning Roadmap, How to prepare for the FedNow Service”, *FedNow Service*, <https://www.frbservices.org/financial-services/fednow/prepare-for-fednow/fednow-readiness-resources> (accessed December 1, 2021). (The Federal Reserve)

QNB must also remain informed of ongoing developments in the real-time payments market and technology space to ensure that changes are understood and reviewed. Decisions may be required related to modifications of the current real-time payment solution utilized and/or additions of new payments solutions.

- Staff training – QNB could face significant challenges in selling a real-time payments solution to customers if staff are not adequately trained in understanding how these payments work, various use cases and the benefits that customers can derive from them. To combat these challenges, QNB will implement a training program for frontline sales and customer support staff to clearly understand aspects of real-time payments which will include use case examples and their benefits. QNB will also implement a training program for back-office support staff to not only understand how these payments work, but also how to enroll customers and troubleshoot potential issues. Any training programs will be designed for not only initial rollout, but in such a way to provide resources for ongoing training of new staff members.

Training will also include back up plans to manage potential system outages or downtime as this may have a negative impact on customer expectations for 24x7x365 access. The Federal Reserve states, “FIs will need to ensure they establish appropriate monitoring and alerting capabilities to

resolve issues that may arise.”²⁶ QNB must review systems to strive for continuous availability and address system hurdles that may prevent this.

- Customer education – In addition to good customer education surrounding the risks and prevention of corporate account takeover that may result in possible financial loss due to the speed at which real-time payments finalize, customers must be well-educated on how to utilize the technology to generate these payments, the flow of such payments and the detailed reporting information and messages transmitted with the payments. They must also be clearly presented various use cases for real-time payments that may assist in easing various points of pain in their current payment processing methods.
- Reputation – On one hand, QNB faces reputation risk if unable to provide real-time payments to customers and they must seek out such solutions elsewhere. On the other hand, QNB faces reputation risk if the real-time payment solution implemented is not user-friendly, doesn't meet customer needs, does not provide stable uptime or access, and is not able to be supported well by staff.

Should QNB choose to not implement a real-time payments solution, there must be a clear message that can be communicated to customers to manage this aspect of QNB's reputation.

²⁶ The Federal Reserve, “FedNow Instant Payments, The FedNow Service Readiness Guide”, *FedNow Service*, <https://www.frbservices.org/financial-services/fednow/prepare-for-fednow/fednow-readiness-resources> (accessed December 1, 2021). (The Federal Reserve)

Should QNB choose to implement a real-time payments solution, several of the items previously mentioned must be addressed with consideration to customer view of organizational reputation.

Organizational Communication

Overcoming the organizational hurdles as outlined can be managed by sharing QNB plans internally within the full organization, and externally with stakeholders and our third-party vendors. By properly planning and managing the project, along with ongoing communication, QNB can successfully implement a real-time payments solution. “Getting your full organization involved and on board – whether you’re a large or small organization – will help you, your employees and your customers reap the benefits of instant payments.”²⁷

²⁷ The Federal Reserve, “FedNow Instant Payments, Preplanning Roadmap, How to prepare for the FedNow Service”, *FedNow Service*, <https://www.frbservices.org/financial-services/fednow/prepare-for-fednow/fednow-readiness-resources> (accessed December 1, 2021).

Conclusion

QNB must take an offensive and defensive strategy when it comes to business payment solutions in order to remain relevant by providing our business customers what they need to effectively operate and prevent them from leaving for another financial institution or fintech. Doing so requires delivery of new technology and payments solutions to meet their ever-changing needs and demands.

The research conducted within this capstone shows benefits to QNB, which include:

- The ability to offer additional value-added products and services to our customers
- The ability to earn new and additional revenue with a positive return on the investment
- Providing better customer service to our customers leading to improved loyalty and greater potential to obtain and retain a full banking relationship
- Demonstrating that QNB is innovative and able to support current payment trends

The research also indicates that implementation of such a solution is a significant project for the Bank and can present many challenges, which can be overcome by proper planning and good communication.

While we do not know exactly what the future of the payments industry looks like, we do know that real-time payments are here and the demand for them is now. Recent history shows how quickly the demand and usage for these payment solutions can grow and it is recommended that QNB prove its readiness by moving forward with implementation of a real-time payments solution to support business customers.

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