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INFORMATION:

Internal Audit Report – Airport Turn Over Reviews Follow-Up

Staff Resource: Greg McDowell, City Auditor, 704-336-8085, gmcowell@charlottenc.gov

The subject audit report is attached. Internal Audit has followed up on two reports issued by McGladrey LLP in 2014, assessing management's progress in implementing the McGladrey recommendations. Aviation's response has been made a part of the report as an attachment.



Aviation Turn Over
Reviews Follow-Up A

Solid Waste Services Receives Ten Additional BigBelly Compactors

Staff Resource: Victoria O. Johnson, Solid Waste Services, 704-336-3410, vjohnson@charlottenc.gov

Ten new dual station BigBelly compactors will be added to the Center City landscape by September 2015. The ten new compactors will provide increased opportunity for recycling on the go and will help Charlotte get closer to reaching zero waste by 2050. The compactors were donated by Waste Management as an additional service to the recycling hauler's contract.

The compactors are wrapped with messages that promote recycling and will be located at the following locations: along the Gold Line; on 5th Street; at 5th and N. Brevard; at N. Caldwell and 5th Streets; at 6th and Tryon Streets; 6th and N. College Streets; and on S. Mint Street in the right-of-way between BBT Ball Park and Bearden Park;

A station will also be placed at Farm Pond Road and Albermarle Roads. Though outside the Center City, this is a very high traffic waste area. The compactor there will help staff assess the utilization of Big Bellys outside the Center City.

The addition of the ten containers expands Solid Waste Services Big Belly container total to 50.

2014 Annual Traffic Collision Data Report

Staff Resource: Angela Berry, CDOT, 704-432-5259, aberry@charlottenc.gov

The Charlotte Department of Transportation (CDOT) has completed its annual collision report using collision data from the 2014 calendar year. The report includes the High Accident Location List. The complete report is attached for reference.

CDOT compiles the traffic safety information annually to serve as an additional tool in the department's efforts to build, maintain, and operate a safe and efficient transportation system.

Overall, Charlotte recorded nearly 23,000 collisions during 2014, a 9 percent increase over the previous year. Annual collisions are approaching pre-recession (pre-2009) levels. Vehicle miles

travelled and population continue to increase, which may be factors in the total collision increase.

The overall number of pedestrian collisions remains fairly level compared to the previous year. Pedestrian fatalities continue to decline:

Year	Pedestrian Fatalities
2012	21
2013	9
2014	7

CDOT uses this report to identify locations that may benefit from infrastructure or operational improvements. With this information CDOT will:

- Take a comprehensive approach to address safety including education, engineering, and enforcement strategies. No single approach fully addresses crash patterns.
- Review all fatal crashes along with CMPD.
- Observe crash trends over many years to determine potential improvements using engineering best practices.
- Use the information gathered as one of many tools to make priority decisions about capital spending on safety projects.



#2014 annual report
- compiled.pdf



CHARLOTTESM

INTERNAL AUDIT

**Audit Report
Airport Turn Over Reviews Follow-Up
August 11, 2015**

**City Auditor's Office
Gregory L. McDowell, CPA, CIA**

Audit Report
Airport Turn Over Reviews Follow-Up
August 11, 2015

Purpose and Scope

The intent of this audit was to determine the implementation status of recommendations made by McGladrey LLP (McGladrey) in two separate Charlotte Douglas International Airport (Airport) Turn Over Reviews dated June 11, 2014. McGladrey conducted its initial fieldwork between October 2013 and February 2014. The Aviation Department (Aviation) identified and tracked progress on 52 recommendations in eight separate categories. Auditors reviewed and assessed management's progress in implementing the recommendations.

We conducted this performance audit in accordance with generally accepted government auditing standards (GAGAS). Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

This report is intended for the use of the City Manager's Office, City Council, and Aviation management.

Conclusion

Management has made progress in implementing the McGladrey recommendations but needs to complete the implementation of some critical processes and formally adopt policies and procedures. Aviation has established plans to resolve the most significant remaining issues within reasonable timeframes.

Summary of McGladrey Recommendations by Category

McGladrey reported a total of 24 findings in its two reports. Many of the findings had multiple recommendations. Aviation has therefore addressed a total of 52 recommendations. The chart on the next page summarizes the recommendations by category and whether audit testing determined that the recommendations have been implemented (33), partially implemented (19) or not yet implemented (none).

In addition to Aviation, Management and Financial Services (M&FS) is responsible for addressing some of the recommendations. For recommendations considered "Partially Implemented," Internal Audit has identified those that are the responsibility of M&FS.

McGladrey Risk Area (Recommendation #'s)	✓	✓ Partially Implemented		✗ Not Implemented		Total
	Implemented	Aviation	M&FS	Aviation	M&FS	
Revenue and Contract Management (1 – 5)	4	1	0	0	0	5
Project and Capital Asset Accounting (6 – 17)	8	4	0	0	0	12
Contract Facility Charges (CFCs) (18 – 22)	4	0	1	0	0	5
Airport Special Statements (23 – 24)	0	1	1	0	0	2
Cost Allocation Plan (CAP) (25 – 28)	2	0	2	0	0	4
Debt Management and Unused Bond Funds (29 – 34)	6	0	0	0	0	6
Parking (35 – 46)	5	7	0	0	0	12
Procurement (47 – 52)	4	1	1	0	0	6
Total	33	14	5	0	0	52

Attachment A contains a matrix indicating the implementation status of each recommendation. The following legend can be used to ascertain the status of recommendations:

- ✓ - Implemented – The recommended action was taken and/or current testing indicated that the original issue has been resolved.
- ✓ - Partially Implemented/Resolved – The recommended action has been started but not yet completed or the recommended action has been completed but testing identified that the original issue has not yet been fully resolved.
- ✗ - Not Implemented – The recommended action has not been completed. Auditor’s judgment was used to determine whether a recommendation was considered implemented, partially implemented or not implemented. The significance of the original recommendation, progress made through February 2015 and the nature of the remaining action necessary were all considered in determining the reported status.

Internal Audit Summary Recommendations and Actions

Aviation has made progress in addressing the McGladrey recommendations, but needs to complete the implementation of critical processes and formally adopt policies and procedures. The Interim Aviation Director's response to the full report is included as Attachment B.

- Aviation management has assigned an individual within its Finance division to coordinate the implementation of the recommendations included in the Turn Over Reviews, including the formal adoption of policies and procedures.

Background

McGladrey conducted Turn Over Reviews of Aviation, resulting in the issuance of two reports in June 2014. The first review focused on six high-risk core areas identified by management and outlined as the first six categories in the summary of implementation chart above. The second review targeted parking revenue and purchasing. For each area reviewed, the reports included observations and recommendations for improvement. According to Aviation management's initial response, most of the recommendations were expected to be fully implemented by the end of calendar year 2014.

Audit Finding and Recommendation

1. **Aviation has made progress in addressing the McGladrey recommendations, but needs to complete the implementation of critical processes, including the formal adoption of policies and procedures.**

McGladrey made 52 recommendations to address high-risk operational areas at the Airport. In July 2014, Aviation management projected that all but two issues would be addressed by calendar year-end. As of the audit report date, 33 of the recommendations had been implemented, as detailed above. The remaining 19 recommendations were partially implemented, including several recommendations related to developing policies and procedures for the following areas:

- pay application review
- project management
- bidder selection
- grant compliance
- change orders, and
- parking operations

While Aviation was able to provide Internal Audit with draft policies and procedures during fieldwork, not all of the policies and procedures have been formally adopted and incorporated into daily routines.

Aviation has utilized Smartsheet, a project management tool that allows for collaboration within the department to assign responsibility, document progress and establish completion timeframes. However, management initially had not assigned a dedicated individual to oversee the implementation of the recommendations across the organization. This resulted in inconsistent responses and some inaccurate reporting of implementation statuses. During the audit, management assigned an individual to be responsible for coordinating the reporting, documentation and verification of implementation actions across the organization which improved reporting consistency.

Recommendation: Aviation should continue to utilize the implementation matrix to assign individual responsibility to, and monitor the implementation status of, recommendations that are not considered fully implemented, including the formal adoption of policies and procedures.

Management Response: Agree. Aviation will utilize the Smartsheet project management tool and the implementation matrix to assign individual responsibility to complete implementation of recommendations contained in this review, including the formal adoption of policies and procedures.

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
1	Contract Administration - begin to develop centralized contract management team.	Completed - Aviation has created an Airport Business Office and worked with Human Resources to create and fill a Business and Relationship Manager position.	Implemented - Aviation has established the Airport Business Office, documented a new organizational structure and has hired a Business and Relationship Manager to oversee revenue contracts.		Aviation
2	Contract Administration - Independent Validation - Document policy/procedures on independent validation of revenue contract supporting documentation, including annual audit plan.	In Progress - Aviation has requested that Internal Audit develop an annual audit plan and worked with Human Resources to fill the Business and Relationship Manager position. This position will be responsible for developing policies and procedures for validation of supporting documentation.	Partially Implemented - Aviation has worked with Internal Audit to develop an annual audit plan but has not yet developed formal policies and procedures for validation of contract supporting documentation. According to Aviation, the newly established Business and Relationship Manager will be responsible for reviewing revenue contract requirements and developing suggestions for possible policies and procedures to better manage those contracts.		Aviation
3	Contract Administration - identify and resolve invoicing issue, in regards to DHL issue.	Completed - Aviation has invoiced DHL for ground rent identified in the observation and DHL has executed a letter of acknowledgement confirming the 25 year amortization term.	Implemented - Auditors noted that adjustments were made to the DHL billing in accordance with the ground rent escalation terms and that DHL executed a letter of acknowledgement confirming the 25 year amortization term.		Aviation

City of Charlotte
Turn Over Reviews – Follow-Up

#	Recommendation	Management's Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
4	Contract Administration - Contract Approval & Documentation - Document policy and procedures around revenue contract management and utilize tools that PROPworks system provides.	In Progress - Aviation has established some internal procedures regarding revenue contracts and has provided training to employees on tools to be utilized through PROPworks.	Implemented – Internal Audit reviewed procedures and training materials for PROPworks and selected a sample of agreements and noted that contract and billing terms were properly reflected in PROPworks. Aviation management noted that they will continue to seek ways to improve contract management through increased use of the capabilities of the PROPworks system.		Aviation
5	Right to Audit Clause - Add the "Right to Audit Clause" to all future revenue contracts.	Completed - Airport Business Office will include a right to audit clause in revenue contracts and will work with Internal Audit to identify the best opportunities to exercise the right to audit.	Implemented – Internal Audit selected a sample of agreements after July 1, 2014 and noted that right to audit clauses were included in contracts except for several irregular airline operating agreements where an older template was still in use.		Aviation
6	Pay Application Review Process - Formalize and document policy and procedures, including checklist to document reviews and reconciliations performed throughout the review process.	In Progress - Completed draft of policy, procedures and checklist. Formal adoption of procedures is pending the formal move of construction procurement from Aviation Development to Aviation Finance.	Partially Implemented - A draft copy of procedures was provided by Aviation staff but has not been formalized as department policy.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
7	Policy and Procedures - Project Management Process - Formalize and document policy and procedures, including checklist to document key procedures from project initiation to project closeout.	In Progress - Completed draft of policy, procedures and checklist. Formal adoption of procedures is pending the formal move of construction procurement from Aviation Development to Aviation Finance.	Partially Implemented - A draft copy of procedures was provided by Aviation staff but has not been formalized as department policy.		Aviation
8	Policy and Procedures - Bidder Selection Process - Formalize and document policy and procedures, including a checklist to document bid process milestones performed throughout the bidding process.	In Progress - Completed draft of policy, procedures and checklist. Formal adoption of procedures is pending the formal move of construction procurement from Aviation Development to Aviation Finance.	Partially Implemented - A draft copy of procedures was provided by Aviation staff but has not been formalized as department policy.		Aviation
9	Policy and Procedures - Grant Compliance Reporting Process - Formalize and document policy and procedures, including a checklist to document key procedures from grant pre-application to grant closeout.	Completed - Documents located on Y Drive (Finance/ERP Policy & Procedures)	Implemented – Aviation staff provided policy and procedures, including a checklist, for grant processes from pre-application to closeout.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
10	Change Order Process - Formalize and document policy and procedures. Be sure policy and procedures documented comply with the Change Order Summary. Establish checklist as part of the change order form, checklist items include but not limited to: purpose of change, entitlement determination, AE drawings, engineer input (as needed), cost (including support), and impact on overall project schedule.	In Progress - Completed draft of policy, procedures and checklist. Formal adoption of procedures is pending the formal move of construction procurement from Aviation Development to Aviation Finance.	Implemented - In the McGladrey report, management’s response was “Aviation and Development does not believe change orders need to include backup documentation when delivered to management for execution. All backup documentation is filed for easy access in the event additional information is required.” Auditors verified that backup documentation exists for selected sample of change orders.		Aviation
11	Grant Application / Funding Process - Formalize and document policy and procedures, including a checklist to document reviews, cash flow and other analysis performed.	Completed - Documents located on Y Drive (Finance/ERP Policy & Procedures)	Implemented – Aviation provided policy and procedures, including a checklist, for grant compliance.		Aviation
12	Capital Projects & Grants - Shadow Capital Projects Cost Report - Continue to maintain involvement with ERP implementation process.	Completed - Shadow reporting no longer used after conversion to Munis.	Implemented - Aviation no longer uses duplicate shadow system with implementation of Munis ERP system.		Aviation

City of Charlotte
Turn Over Reviews – Follow-Up

#	Recommendation	Management's Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
13	Pay Applications Review and Approval - Implement controls in review process that includes: Recalculating the roll-up of the schedule of values for each monthly pay application for accuracy of the amounts being billed and documentation of review/approval steps in the pay application review process.	In Progress - Completed draft of policy, procedures and checklist.	Implemented - Auditors reviewed a sample of five pay applications from FY2015 and noted that amounts were properly calculated and that schedules of values were accurately rolled-up to the pay application summary. Auditors noted that required approvals were evident on the sampled pay applications.		Aviation
14	Pay Applications Review and Approval - Pay application review; Retainage Control - Implement a control in the pay application review process that includes reviewing the retainage amount for each pay application for accuracy and consistency with the contract terms - this task goes with task #13.	In Progress - Completed draft of policy and procedures.	Implemented - Auditors reviewed a sample of five pay applications from FY2015 and noted that retainage was properly calculated based on contract terms.		Aviation
15	Pay Applications Review and Approval - Implement use of pay application review/approval checklist - this task goes with task #13 & #14.	In Progress - Completed draft of policy, procedures and checklist	Implemented - Auditors reviewed a sample of five pay applications from FY2015 and noted amounts on the pay applications were accurately calculated and included evidence of required approvals.		Aviation

City of Charlotte
Turn Over Reviews – Follow-Up

#	Recommendation	Management's Implementation Status	Internal Audit		Responsible Department
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16	Change Order Process - Approval Threshold - Continue to work with City regarding the City Council threshold to ensure proper approval is obtained as per City's procurement policy.	In Progress - Aviation will work with the City regarding City Council threshold requirement. Aviation is currently utilizing consultants to provide analysis of Aviation procurement business process. The consultant has identified possible improvements in a draft report, which will be finalized in Fall 2015.	Partially Implemented - Aviation has hired consultants to provide analysis of Aviation procurement business process, which includes identifying process improvements that the City could implement to allow Aviation more flexibility or greater speed in procuring goods and services.		Aviation
17	Change Order Process - Inclusion of clear description and documentation as to the purpose and nature of the change in the determination of entitlement of change order to be included on change order form.	Completed - Completed draft of policy/procedures.	Implemented - Auditors verified that a selected sample of change orders contained clear descriptions and documentation as to the purpose and nature of the change orders.		Aviation
18	Automobile Rental Concession Agreements - Create and distribute letter to Car Rental companies regarding compliance with contract terms and conditions - more specifically centered on self-reporting requirements.	Completed - Aviation notified all rental car concession companies of their requirement to comply with financial, CFC and activity reporting requirements as required by the terms of the 2011 Rental Car Concession Agreement.	Implemented – Aviation notified all rental car concession companies of their requirement to comply with CFC reporting requirements. For the period July through November 2014, Internal Audit noted that vendors submitted their fees by the 25th of the succeeding month 91% of the time.		Aviation

City of Charlotte
Turn Over Reviews – Follow-Up

#	Recommendation	Management's Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
19	Automobile Rental Concession Agreements - Reconciliation of supporting documentation to the CFC trust statements and GL to occur periodically.	Completed - Aviation obtains copies of the CFC Trustee statements from City Finance and compares and reconciles the monthly CFC activity reports; City Finance ensures that the trust statements agree to the City's general ledger.	Partially Implemented – Auditors found that Aviation staff reconciles the CFC activity reports to the trustee statements. For the period July 2014 through November 2014, no exceptions were noted. However, Auditors noted that Finance had not recorded FY15 trustee deposits in the City's general ledger.		M&FS Financial Reporting
20	Automobile Rental Concession Agreements - Use of CFC - create and distribute Aviation standardized self-report form to be used by car rental companies.	Completed - Aviation monitors CFC reports and requests vendor compliance if reports do not contain adequate documentation of rental days.	Implemented – Internal Audit noted that rental car companies submit monthly reports that meet the minimum data requirements of Aviation.		Aviation
21	Automobile Rental Concession Agreements - Aviation Management to schedule and carry out regular periodic review of monthly reports to ensure compliance.	Completed - Monthly reports are reviewed for completeness and adherence to requirements.	Implemented – While auditors noted that Aviation staff review and input the monthly activity reports, this has not increased the timeliness of reporting, as the reports are not always received by the 10th of the month.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
22	Automobile Rental Concession Agreements - Aviation to review Trustee statements and identify any discrepancies with the CFC reports received.	Completed - Aviation obtains copies of the CFC Trustee statements from City Finance and compares and reconciles the monthly CFC activity reports.	Implemented – Auditors noted that an Accountant reconciles deposits recorded on CFC Trustee statements to monthly CFC activity reports. For the period July 2014 through November 2014, no exceptions were noted.		Aviation
23	Reconciliation of CAFR to Airport Enterprise Fund Financial Statements	In Progress – The City issued the inaugural Airport Annual Report for FY 2014 in June 2015, which included all relevant reconciled financial statements.	Partially Implemented – Subsequent to audit fieldwork, Aviation provided the inaugural annual report which agreed to the City’s CAFR.		M&FS Financial Reporting
24	Timing of Submission and Reconciliation of Financial Reports to the FAA.	In Progress - FY13 certified. FY14 preliminary figures entered into FAA website and were finalized and certified upon completion of consolidated Annual Report in June 2015.	Partially Implemented - Aviation did not submit the completed FAA report within the 120 days noted in the McGladrey recommendation. However, Aviation personnel were in contact with the proper FAA representative and requested appropriate extensions.		Aviation

City of Charlotte
Turn Over Reviews – Follow-Up

#	Recommendation	Management's Implementation Status	Internal Audit		Responsible Department
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25	Methodology Documentation and Monitoring - Ownership of the CAP – The Office of Strategy and Budget (S&B - formerly Budget and Evaluation) to be responsible for accumulating the CAP data and Aviation staff responsible for accuracy of CAP data.	Completed - City S&B has worked with an external consultant to review the City's current CAP methodology and make recommendations for changes to ensure compliance with OMB Circular A-87.	Implemented – S&B has not developed formal policies and procedures to document and monitor the CAP. However, the division has taken the lead in working with an external consultant to develop a CAP that is in compliance with OMB Circular A-87 requirements.		M&FS Office of Strategy and Budget
26	Methodology Documentation and Monitoring - Documentation of CAP Methodologies by department to ensure consistency of retention requirements.	Completed - City S&B has retained documentation supporting departmental cost allocations.	Implemented - Internal Audit selected a sample of department allocations from the FY2015 CAP and noted that Budget and Evaluation had retained adequate supporting documentation for each allocation.		M&FS Office of Strategy and Budget
27	CAP Approval – Office of Strategy and Budget to obtain FTA approval of OMB Circular A-87 as required.	In Progress - City S&B submitted the FY16 CAP to the FTA for approval in July 2015.	Partially Implemented - S&B submitted the FY16 CAP to the FTA in July 2015 but has not obtained FTA approval.		M&FS Office of Strategy and Budget

City of Charlotte
Turn Over Reviews – Follow-Up

#	Recommendation	Management's Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
28	Basis for Cost Allocation Plan - Actual expenditures as basis for CAP pursuant to OMB Circular A-87.	In Progress - City S&B submitted the FY16 CAP to the FTA for approval in July 2015. This was the first CAP submitted based on actual expenditures (i.e., FY14 actuals). A "true-up" of FY16 allocations to actual amounts will occur when actual FY16 amounts are available.	Partially Implemented - S&B submitted the FY16 CAP to the FTA in July 2015. The CAP was based on FY14 actual expenditures.		M&FS Office of Strategy and Budget
29	Bond Funded Project Invoice Support, Coding and Tracking - Invoicing - Advised contractors to submit one project per invoice and/or PO, including direct payments.	Completed - Aviation Finance has requested current contractors provide individual invoices for each project. If contract terms or circumstances prevent individual invoices, Aviation will request invoices with line-item detail for each discrete project.	Implemented - Internal Audit sampled invoices from a vendor on multiple projects (W Terminal Expansion and Baggage Handling Construction) and verified they are submitting separate invoices for different projects.		Aviation
30	Bond Funded Project Invoice Support, Coding and Tracking - Direct Payments - Schedule invoice sampling for project related invoices to ensure coding is done accurately.	Completed - Direct Payments are no longer allowed as part of Munis conversion.	Departments have been allowed to use direct pays with wet signature authorization and appropriate expense account data written on the physical invoice. Auditors reviewed 15 Aviation direct payments over \$25,000 and noted that Aviation's use of direct pays was consistent with City policy and resulted in accurate project coding.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
31	Bond Funded Project Invoice Support, Coding and Tracking - Invoicing - Aviation staff to periodically sample project invoices and verify amounts are coded correctly.	Completed - Although no invoices are sampled periodically, projects are carefully verified to ensure coding is done correctly prior to payment. When a vendor submits an invoice, Aviation Finance reviews for amounts and correct coding before forwarding to project managers to confirm the work was actually completed.	Implemented - Aviation hired a full-time project cost and grant accountant in November 2013 to verify invoices prior to payment. Internal Audit reviewed an invoice that was rejected due to incorrect project coding and re- sent to the vendor for correction. Auditors also selected five invoices for testing and verified that amounts were coded correctly.		Aviation
32	Financial, Debt Management, and Accounting Policy for the Airport - Project Review and Tracking Procedures - Aviation Project Accountant to periodically sample project invoices and verify project funding source is accurate. This task is associated with Task #31.	Completed - Although no projects are sampled periodically, projects are carefully verified to ensure funding sources are from the correct account. Aviation Finance reviews for correct amounts and coding before forwarding to project managers to confirm the work was actually completed.	Implemented - Aviation hired a full-time project cost and grant accountant in November 2013 to verify invoices prior to payment. Auditors reviewed five invoices for the rental car facility and hourly deck project and verified that funding sources were accurate.		Aviation

City of Charlotte
Turn Over Reviews – Follow-Up

#	Recommendation	Management's Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
33	Financial, Debt Management, and Accounting Policy for the Airport - Unused Bond Proceeds - Prepare summary of bond proceeds that are unspent and develop a plan for use of unused bond proceeds This task is to be done in accordance with City's Financial Department Policy.	Completed - The Airport has prepared a draft plan for the use of unspent bond proceeds. Since implementation of the plan, the City has expended all proceeds in the 2004 Bonds Construction Fund. The Airport has also identified current active projects which require use of remaining bond funds in respective Series 2007; 2010; 2011; and 2014. Airport Finance will meet with City Finance – Treasury no less than once a year to review unused Bond Proceeds.	Implemented – Auditors reviewed the unexpended bond fund plan and noted that Aviation is working with City Finance – Treasury to periodically prepare a summary of unspent bond proceeds. The last summary was prepared as of October 31, 2014.		Aviation
34	Financial, Debt Management, and Accounting Policy for the Airport - Unused Bond Proceeds - City Finance to consult with Bond Counsel on Aviation's proposed plan for unused bond proceeds in accordance with City's Financial Department Policy.	Completed - Since the Airport does not currently anticipate using remaining bond proceeds for new projects, there is no need to contact bond counsel to request a tax opinion.	Implemented - Auditors reviewed a summary of unspent bond proceeds and noted that Aviation has identified active projects which require the use of the remaining bond funds.		Aviation
35	Vendor Contract - obtain new parking management firm.	Completed - New Vendor: SP+	Implemented - Aviation awarded a bid to SP+ to manage parking, effective April 1, 2014.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
36	Vendor Contract - Modify parking management contract to include modifications to cover non-performance issued should they arise.	Completed - New Vendor SP+ contract issued	Implemented - Auditors noted that the SP+ contract includes a list of fines for failure to provide "Required Reports" in Exhibit B. The Scheidt & Bachmann contract includes \$500 penalty if contractor fails to respond to major system failure within set timeframe.		Aviation
37	Vendor Contract - New parking management firm contract requires the performance of LPIs on a daily basis. Aviation Parking staff to monitor and ensure compliance with the LPI requirement.	In Progress - Aviation Parking Management acknowledges parking management company (SP+) requirement to provide nightly License Plate Inventory (LPI). Airport Parking Management acknowledges technical problems with LPI handheld equipment unload to the revenue control system (S&B). Airport Parking Management has been in regular communication with S&B regarding this issue. S&B provided a new operators manual to confirm proper handheld use and to troubleshoot possible problems. S&B conducted an on-site evaluation and resolved the issue in May 2015.	Partially Implemented – During audit fieldwork, auditors noted that LPI handhelds did not function properly for several months, therefore, no daily LPI reports were available to monitor. This is not in compliance with Article VI of the contract, which requires the vendor to complete nightly inventories. Subsequent to audit fieldwork, Aviation management worked with the system vendor to restore the desired functionality in May 2015.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
38	Non-Revenue Parking - Access Cards - Aviation operations maintain access card list and conduct audit of list on annual bases.	Completed - Aviation management retrieved and terminated the use of all access cards and issuance of new access cards beginning Summer 2013.	Implemented - Auditors noted that Aviation has retrieved all access cards and has discontinued the issuance of access cards.		Aviation
39	Gate Reset - New parking management firm to maintain gate reset reports. Aviation management to conduct daily review of gate reset report.	Completed - Airport Parking developed and implemented a daily parking gate reset summary. Airport Parking utilizes information generated from the S&B revenue control system and information provided by the cashiers to identify each instance of a gate reset. This information is compiled daily on the parking gate reset summary and reviewed by Airport Parking management. It should also be noted that the Airport is currently underway with extensive public parking construction near the pay booths. This has resulted in a significant number of gate resets to provide required access by construction contractors. Airport management anticipates a decline in gate resets upon completion of the public parking improvements.	Partially Implemented – Auditors noted that daily gate reset reports (logs) are provided to Aviation management. Although management indicated that these reports are reviewed daily, auditors did not see evidence of these reviews as the reports and logs are not signed or initialed by Aviation management and no specific action was required in response to the daily reviews.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
40	Financial Reporting and Monitoring - Daily Reconciliations - Aviation to ensure new Parking Management firm is providing back up documentation for all cancelled tickets and coupons issued.	Completed - Aviation Parking management requires that back up documentation be supplied for all cancelled tickets and coupons issued.	Implemented – Aviation requires that the vendor provide supporting documentation for each cancelled ticket and coupon issued. Auditors reviewed a sample of daily reports from January 2015 and noted that supporting documentation was obtained for each reported lost ticket and coupon issued.		Aviation
41	Financial Reporting and Monitoring - Daily Reconciliations - Scheidt & Bachmann (S&B) to perform training on the terminals for personnel operating the terminals.	In Progress - SB Terminal is not currently set up to handle PDR. Aviation Department is actively pursuing the implementation of cashiering system. Given Aviation Department budgetary restrictions this item is currently scheduled for FY17.	Partially Implemented - Although staff has been trained to operate the S&B terminal, the McGladrey recommendation was to have a fully functional cashier terminal available in the PDR to enable all transactions to be recorded in the system and eliminate a manual Cashier Payment Dispatch Log. Records were still kept manually in the PDR during Internal Audit's visit.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit Conclusion	Status	Responsible Department
42	Financial Reporting and Monitoring - Monitoring - Current canned report package purchased does not include access to several recommended reports. New Parking Management firm, who have extensive knowledge of parking system, will review current reporting and make recommendations to Aviation.	In Progress - Airport Parking management has met with representatives of SP+ to discuss reporting capabilities of the S&B parking revenue control system with the objective of enhancing review and analysis of public parking transaction activities. Aviation Parking personnel have been trained on how to pull reports which will assist Airport Management with the review and analysis of daily parking activities. Aviation is now actively pulling parking transaction data and conducting trend analysis.	Partially Implemented - Aviation provided auditors with examples of additional reporting capabilities but stated that a decision has not been finalized on which reports, if any, would be useful for trending and analysis. Subsequent to audit fieldwork, Aviation management noted that staff had conducted additional analysis and are now utilizing parking data for trend analysis.		Aviation
43	Policy & Procedures - Update existing policy and procedures to reflect current practices.	In Progress - Policy & Procedures for Parking Mgmt. Staff and Aviation Parking Staff have been updated and are under review by Aviation Legal Team. The two Policy & Procedures manuals will be combined into a master document after Aviation Legal Team review.	Partially Implemented - Aviation provided auditors with two draft policies that will be combined into one after Aviation Legal review. One policy was the SP+ cashier guidelines and the second was a cash handling guideline for Aviation Parking personnel. There were no specific guidelines on how Aviation monitors SP+, particularly what is reviewed daily, monthly, and annually. Providing detail on how Aviation manages the vendor allows for contract compliance, segregation of duties, and operational efficiency.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
44	Insufficient Funds - Document and implement timeframe for writing off ISF transactions.	In Progress - ISF's previous to January 2013 have been written off. Aviation developed policy/procedures regarding ISF write offs. The policy/procedures will include all uncollectable ISFs to be written off 90 days following the end of previous fiscal year.	Partially Implemented. Aviation provided draft policies and procedures for the write-off of amounts owed. However, auditors noted that FY14 receivable amounts have not been written off and that an aging report of outstanding receivables is not available.		Aviation
45	Insufficient Funds - Aviation Parking and Aviation Finance to work with Scheidt and Bachman in the development of improved reporting capability.	In Progress - Aviation Parking generates daily insufficient funds (ISFs) reports from the S&B system. The daily ISF report is provided and reviewed by the Ground Transportation Manager on a daily basis.	Partially Implemented. Aviation provided documentation indicating that daily ISF reports are reviewed. However, auditors noted that an aging report of outstanding receivables is not available, as recommended in the McGladrey report.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
46	Cashier Booth Security Cameras - Review practicality of adding security cameras to cashier booths as they are relocated to new exit plazas.	In Progress - Aviation has assessed the practicality of adding security cameras to public parking pay booths. Notwithstanding concerns related to the benefit-cost and financial feasibility of adding a security camera system to each cashier booth, Aviation feels it is not practical to consider implementation of security cameras when parking pay booths are scheduled for relocation in the Fall of 2015. Aviation will reassess the cost-benefit of adding security cameras following the relocation of the cashier booths.	Implemented. According to Aviation management, the feasibility of this recommendation was reviewed and it was determined that Aviation would reassess the cost-benefit of adding security cameras following a planned future relocation of the cashier booths in the fall of 2015.		Aviation
47	Vendor Master File Review - Perform annual review of master vendor file to minimize the risk of unnecessary multiple vendors.	Completed - Task was complete in preparation for ERP system implementation and remains ongoing.	Implemented – Under the City’s new ERP system, Management and Financial Services reviews vendor files monthly and merges duplicate vendors. Staff indicated that this process is ongoing and is expected to take approximately one year to complete.		Aviation

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
48	Purchase Approval and Documentation - Purchases via Purchase Order - Periodically review of POs to ensure compliance with policy/procedures and identify deficiencies for follow up.	Completed - Compliance is built into requisition and purchase order change order approval workflows (Operating Funds only)	Implemented – Auditors reviewed a sample of Aviation purchase orders and noted compliance with City policies and procedures. Auditors also noted that Aviation has contracted with a consultant to identify process improvements that could be implemented to allow the Aviation Department more flexibility or greater speed in procuring goods and services. Results of this engagement are expected to be available in the spring of 2015.		Aviation
49	Purchase Approval and Documentation - Direct Payments - Although the direct payments were approved by the KBE or Deputy KBE, the proper process should have included submission of a modified or new purchase order prior to receipt of goods or services and invoice presentation.	Completed - Direct Payments are no longer allowed as part of Munis conversion.	Partially Implemented – Departments have been allowed to use direct pays with wet signature authorization and appropriate expense account data written on the physical invoice. Auditors reviewed 15 Aviation direct payments over \$25,000 and noted that Aviation’s use of direct pays was consistent with City policy. Note: Wet signature authorization was eliminated in February 2015 as part of the on-going implementation of Munis controls.		Citywide (M&FS)

**City of Charlotte
Turn Over Reviews – Follow-Up**

#	Recommendation	Management’s Implementation Status	Internal Audit		Responsible Department
			Conclusion	Status	
50	Use of Contract vs Purchase Order - Contract vs PO - Use of contract to define and document terms and conditions (in addition to those on the purchase order) when purchase is greater than \$10,000.00 for goods and services per Citywide new Procurement Policy.	Completed - The new City-wide Procurement Policy specifies the dollar thresholds whereby a contract is 'highly recommended' and 'required'.	Implemented – Auditors sampled payments over \$10,000 without associated contracts and found only one payment that did not have an associated contract or purchase order.		Aviation
51	Use of Contract vs Purchase Order - Contract Review - Aviation Legal team to maintain version control and the conversion to final legal-approved contract into a format that does not allow edits.	Completed - Given only certain contracts are subject to legal review, it is impractical for Aviation Legal to maintain version control for all contracts. Furthermore, all contacts requiring legal review are shared with Aviation Procurement for the processing of edits and locked for contract distribution and execution.	Partially Implemented – Auditors noted that Aviation considered the recommendation and determined that an alternate solution would meet their practical needs.		Aviation
52	Segregation of Duties and User Access - Review access levels and remove/delete unnecessary access levels.	Completed - Done as part of prep for Munis go live.	Implemented – Auditors reviewed documentation indicating that Aviation security roles were assigned in Munis in accordance with City policy. The ERP resource team periodically reviews access levels for conflicting roles.		Aviation

CITY OF CHARLOTTE AVIATION DEPARTMENT

August 11, 2015

TO: City of Charlotte Internal Audit
FROM: Brent Cagle, Interim Aviation Director
RE: Airport Turnover Review – Compliance Audit

In 2013, the City engaged the accounting firm McGladrey, LLC to initiate a turnover review ("Review") of the Charlotte Douglas International Airport. City and Airport Management identified certain high-risk core areas to be included in the Review. These areas included:

- Billing and Revenues;
- Internal Controls, Project and Capital Asset Accounting;
- Rental Car Contract Facility Charges;
- Reconciliation of the Airport Special Financial Statement with the Comprehensive Annual Financial Report;
- Expense Reimbursements to the City;
- Debt Management;
- Parking Revenue Management; and
- Airport Purchasing.

McGladrey published its Review including observations and recommendations on June 11, 2014. McGladrey reported a total of 24 findings, many findings having multiple recommendations. Airport Management, with assistance from the City's Management and Financial Services Department ("M&FS") responded to all 52 recommendations related to core high risk areas identified in the Review. In January 2015, Airport Management requested Internal Audit conduct a performance audit ("Performance Audit") to assess the progress in implementing all 52 recommendations in Turnover Review.

Airport Management was actively engaged in developing the scope of the Performance Audit and in collecting the data necessary for Internal Audit's review. As referenced in the Report issued by your office, we have made significant progress in addressing key recommendations contained in the Turnover Review. In total, we are pleased to report

the full implementation of 33 of 52 recommendations contained in the Turnover Review. We have also made significant progress in implementing 14 additional recommendations. The remaining five recommendations are being implemented by Management & Financial Services.

In connection with this effort, we have completed a thorough assessment of critical processes as referenced in both the Turnover Review and the Performance Audit. We will continue our efforts to enhance the documentation of critical processes and the formal adoption of policies and procedures, with a focus on the areas of:

- Pay application review;
- Project management;
- Bidder selection;
- Grant compliance;
- Change orders; and
- Parking operations.

Certain of these processes will be documented in connection with the proposed transfer of the Airport's construction procurement function from the Aviation Development Division to the Aviation Finance Division – Procurement Section. We believe this change in structure will provide a platform that will result in enhanced process consistency and customer service delivery.

In addition, Airport Management has dedicated certain personnel to oversee the implementation of recommendations resulting from the Turnover Review and Performance Audit. We are also expanding our use of technology based project management solutions which will allow for managing the documentation and verification of implementing the proposed recommendations.

In conclusion, Airport Management found significant value in the Turnover Review and Internal Audit's subsequent Performance Audit. These reviews have provided Airport Management with valuable recommendations and will help the Airport to identify, assess and mitigate financial and business risk levels.

cc: Michael Hill, Asst. Aviation Director - Finance
Haley Gentry, Asst. Aviation Director – Business and Revenue



Traffic Collision Data for 2014

Charlotte Department of Transportation
Traffic Safety Section

July 29, 2015

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Summary

The Charlotte Department of Transportation (CDOT) releases collision data for the previous calendar year annually. The Traffic Safety Section within CDOT is responsible for the compilation and analysis of collisions that occur within the road right of way inside the city limits of Charlotte. Included in this report are the collision data and trends from calendar year 2014. The data presented in this report does not include collisions that occurred on the Interstate highways (I-77, I-277, I-85, and I-485) or collisions that occur within private lots and parking areas.

CDOT compiles the collision data information to serve as a tool in the Department's efforts to build, maintain and operate a safe and efficient transportation system. Please see the "Quick Facts" page following the summary for pertinent details around the graphs and tables presented in the report.

In addition to the graphs and tables presenting the collision facts for 2014, this report includes two lists that focus efforts in identifying collision trends. For these two lists, data for the City's 19,242 intersections, including 814 signalized intersections, are evaluated.

The first is a list of intersections commonly referred to as the High Accident Location (HAL) list. The 2015 HAL is based on data collected during the 2014 calendar year. While the HAL is used by CDOT and City staff as a tool to identify collision trends, the purpose of including it in this report is to heighten road user awareness of locations that have an elevated collision rate. To put the HAL in perspective, it should be noted that of the 19,242 intersections in the City of Charlotte, 83 (less than half a percent) are on the HAL. Of the 83 intersections on the HAL, 68 or nearly 82% are controlled by a traffic signal.

The second list is the Intersection Safety Warrant list. It is recalculated every two years and was updated for this year's report. Again this list is a tool used by CDOT and City staff and the purpose of including it in this report is to heighten road user awareness of locations that have elevated patterns of collisions. To put the Safety Warrant list in perspective, it should be noted that of the 19,242 intersections in the City of Charlotte, 303 (1.6%) meet one or more Intersection Safety Warrants.

All data used for this report is current at the date of printing. CDOT reserves the right to revise any and all collision information contained herein without providing additional notice. For current information regarding specific locations contact the Traffic Safety Section.

For additional information please contact:

Angela M. Berry, PE
Traffic Safety, ITS and Special Projects Section Manager
Charlotte Department of Transportation
704-432-5259
aberry@charlottenc.gov

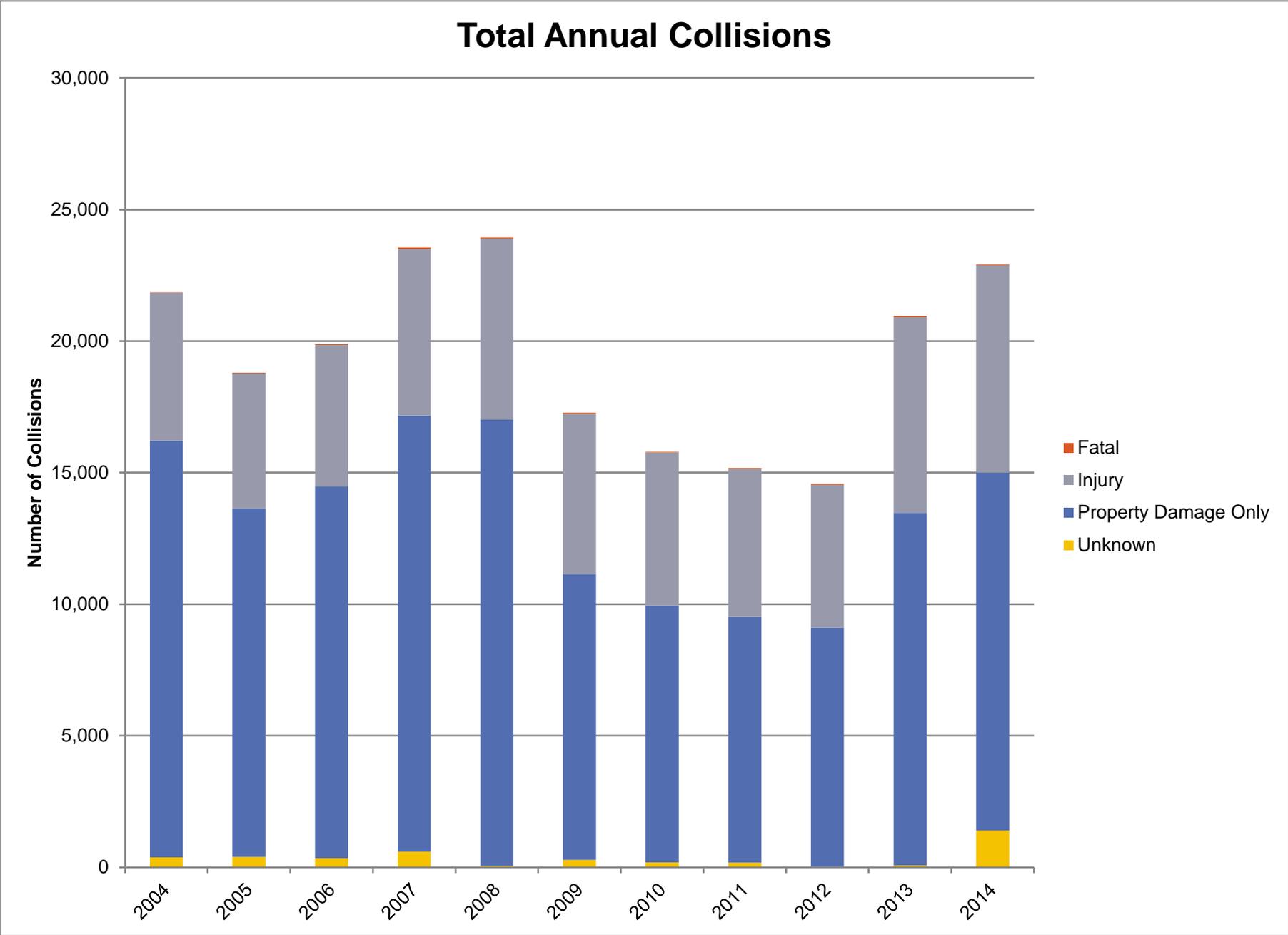
Quick Facts

- *Fatal collisions were down 10% from 43 in 2013 to 39 in 2014.*
- *Total collisions were up 9.38% in 2014 from 20,957 total collisions in 2013 to 22,923 in 2014. Total collisions are approaching pre-recession (pre-2009) levels.*
- *Vehicle Miles Travelled and Population continue to increase which may be a factor in the increase in total collisions.*
- *Overall pedestrian collisions remain fairly level compared to last year; however pedestrian fatalities continue to decline and are down 28% from last year and down 300% from 2012.*
- *Nearly 23% of collisions involved driver inattention or distraction. This is in line with statistics statewide and nationwide.*
- *More than 70% of collisions in 2014 occurred during daylight hours.*
- *More than 82% of collisions in 2014 occurred during dry driving conditions.*
- *Fatal collisions account for less than one percent of all collisions in the City of Charlotte.*
- *Fixed object and departing the roadway collisions account for 33% (13 of the 39) fatal collisions.*
- *The 39 fatal collisions resulted in 41 fatalities in 2014.*
- *The crash rate used in the High Accident Location list is a math formula that depends on traffic volume and total numbers of crashes. Locations with a moderate number of crashes and low traffic volumes may be ranked higher.*
- *The intersection of Cambridge Commons and Harrisburg Road, number 1 on the HAL in 2012, was rebuilt as a roundabout and has now dropped to number 10 on the list.*

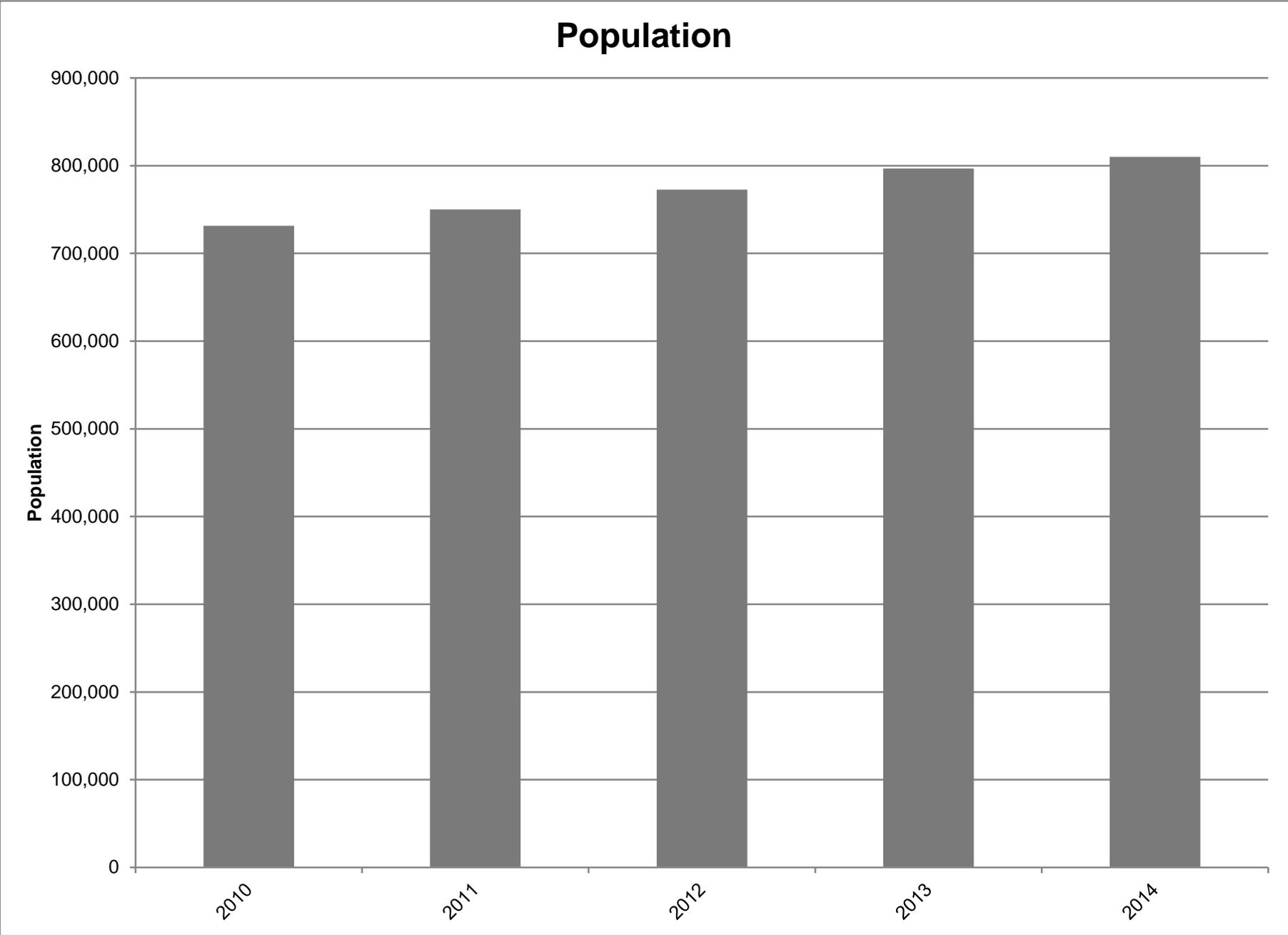
Quick Tips

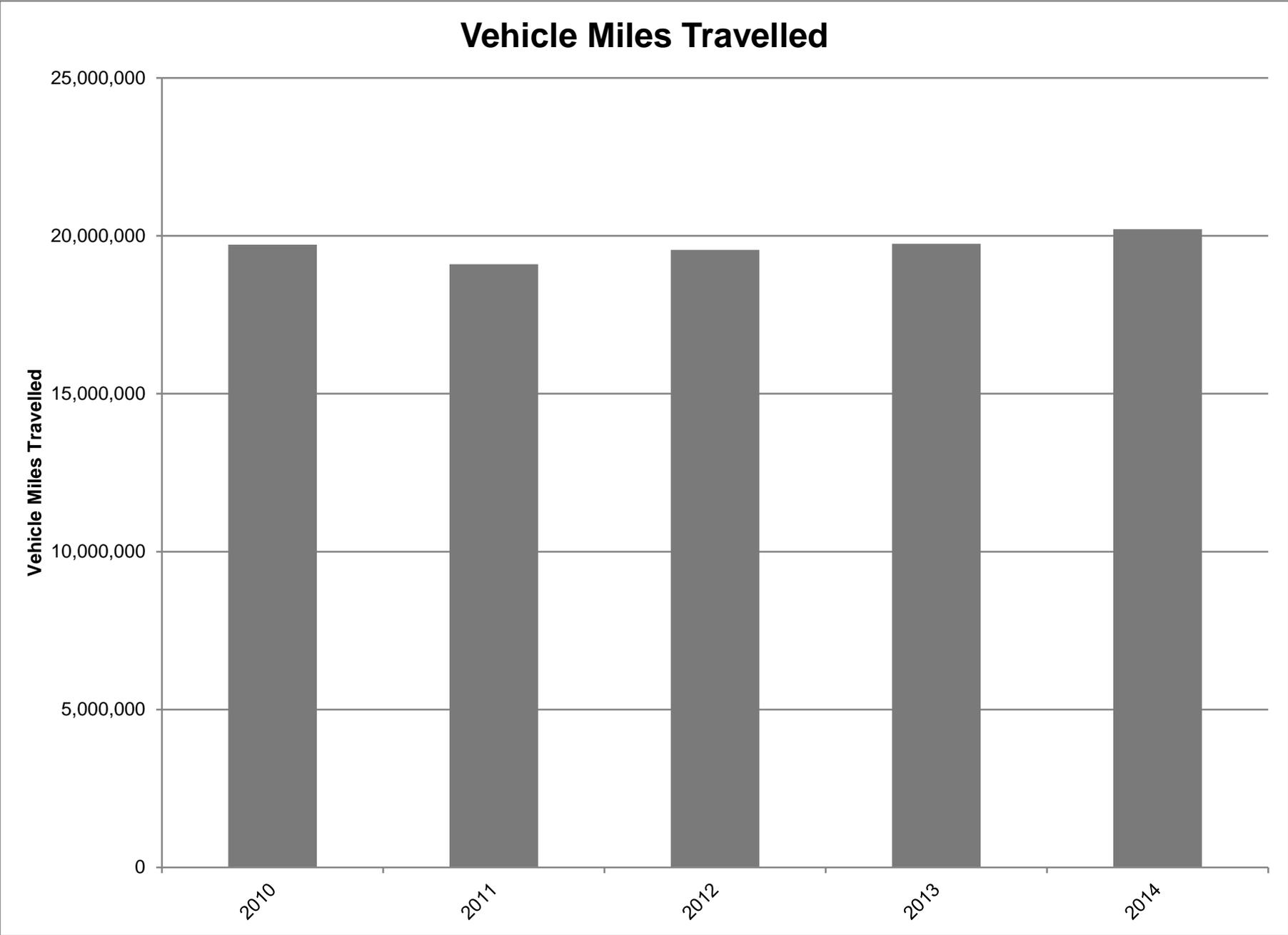
- *Drivers and bicyclists are all encouraged to limit distractions while driving.*
- *Pedestrians are encouraged to limit distractions and remain aware of the motor vehicle traffic around them.*
- *Pedestrians and bicyclists remain our most vulnerable roadway users and drivers are encouraged to watch for them.*

2014 Collision Data

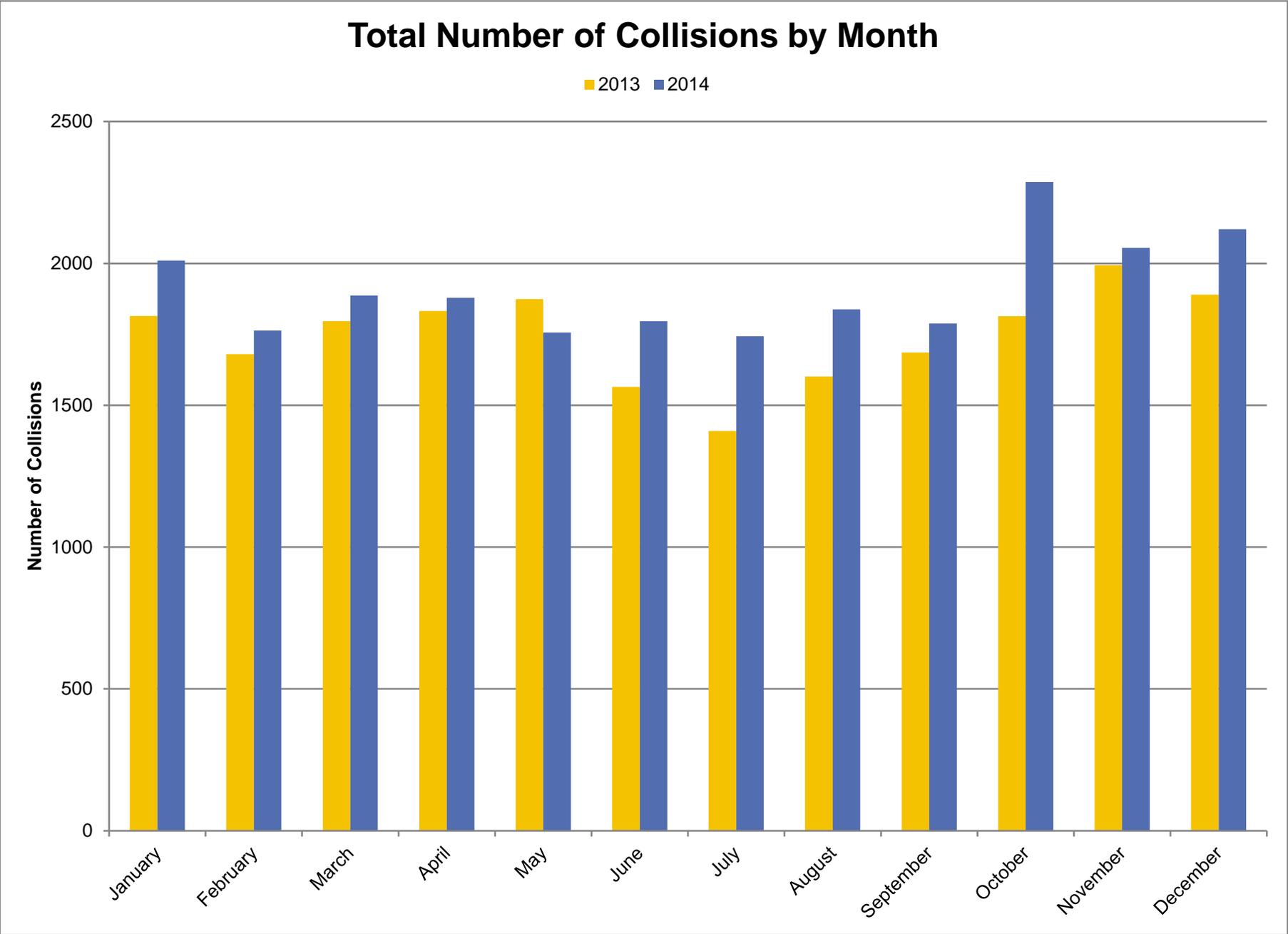


2014 Collision Data

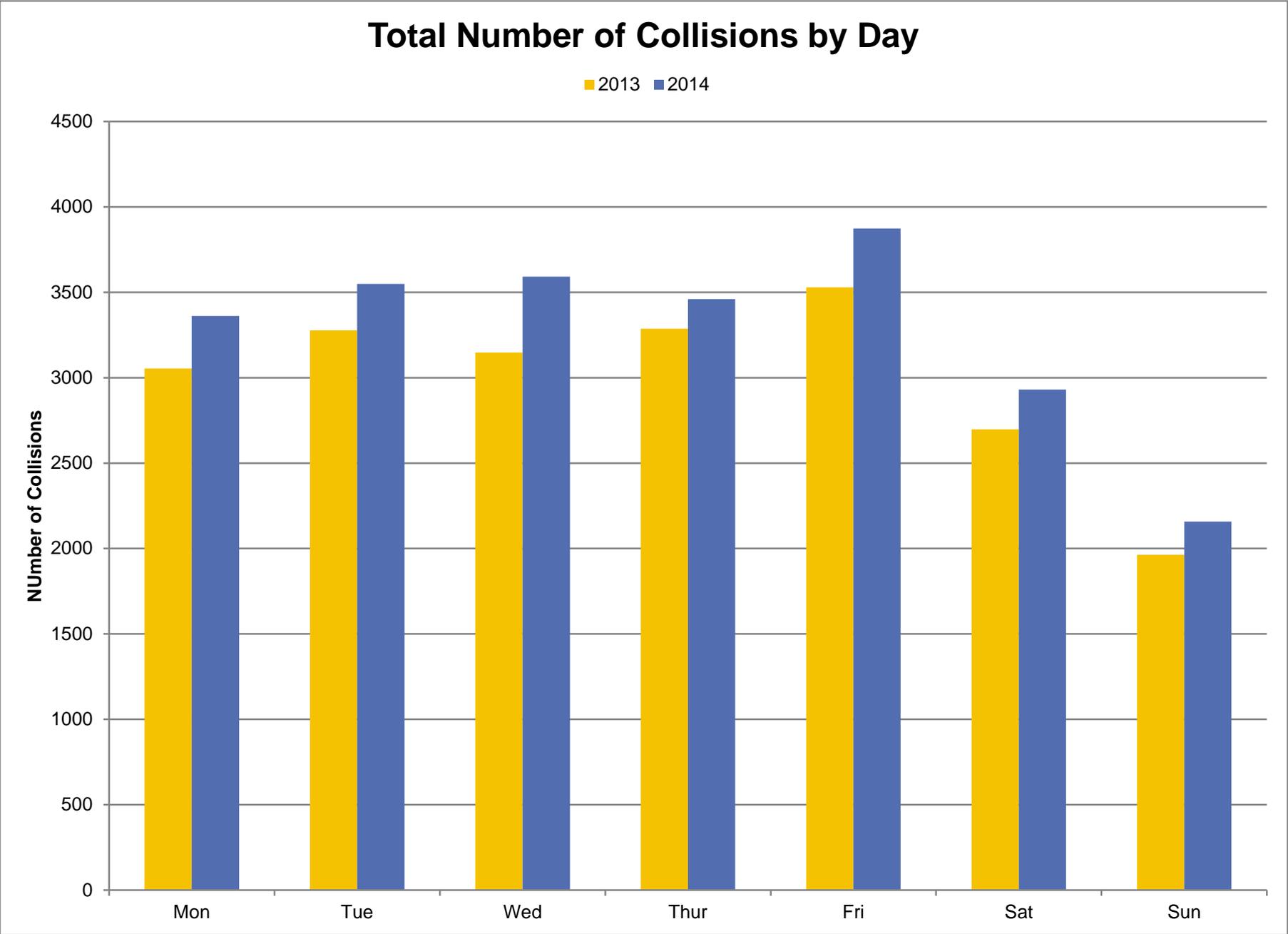




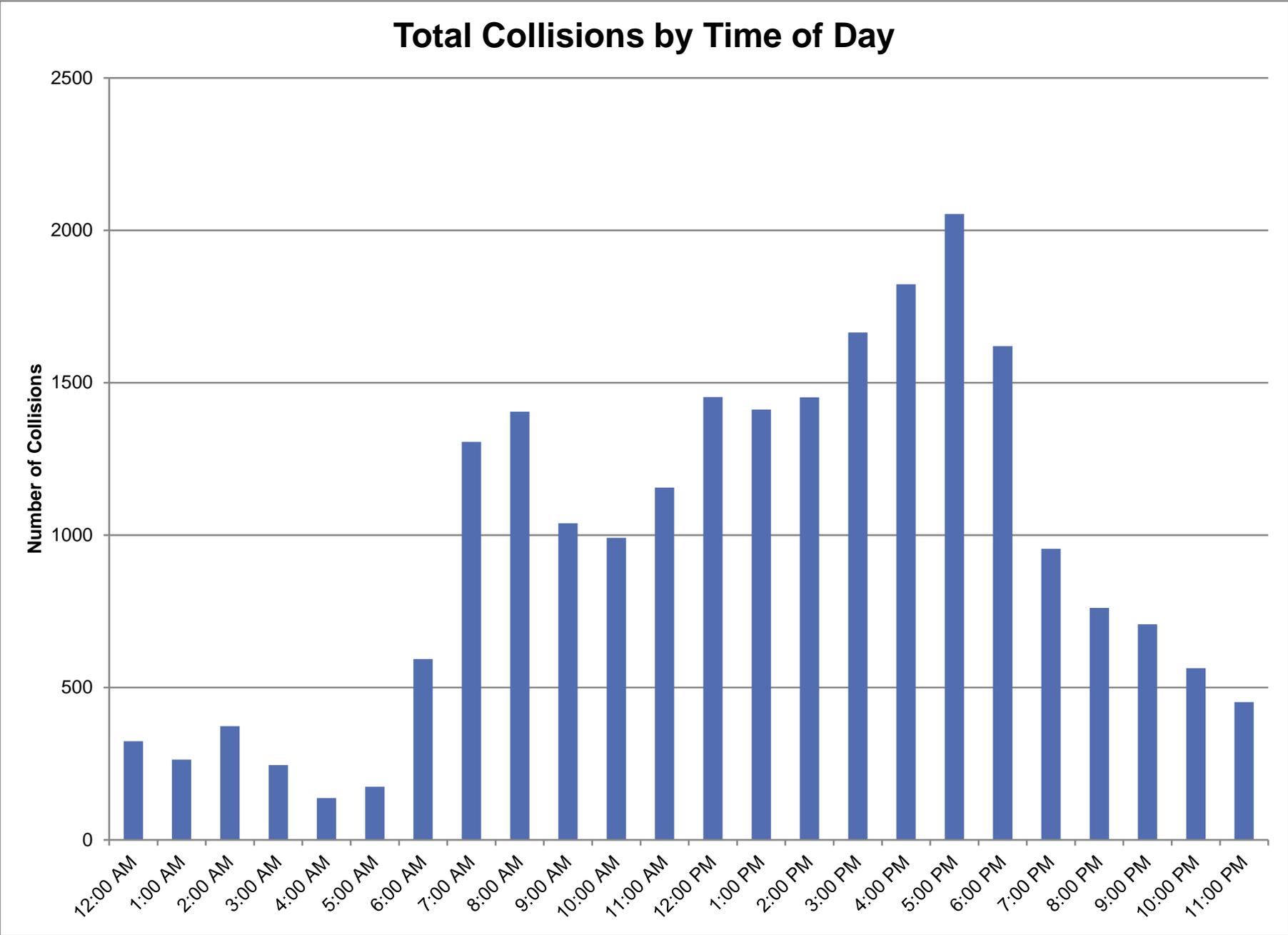
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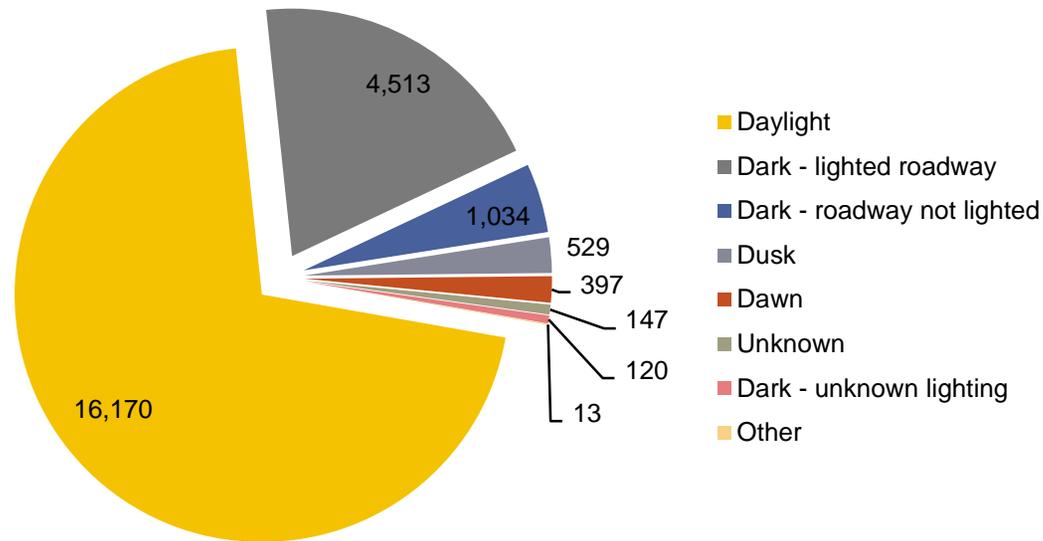
2014 Collision Data



2014 Collision Data

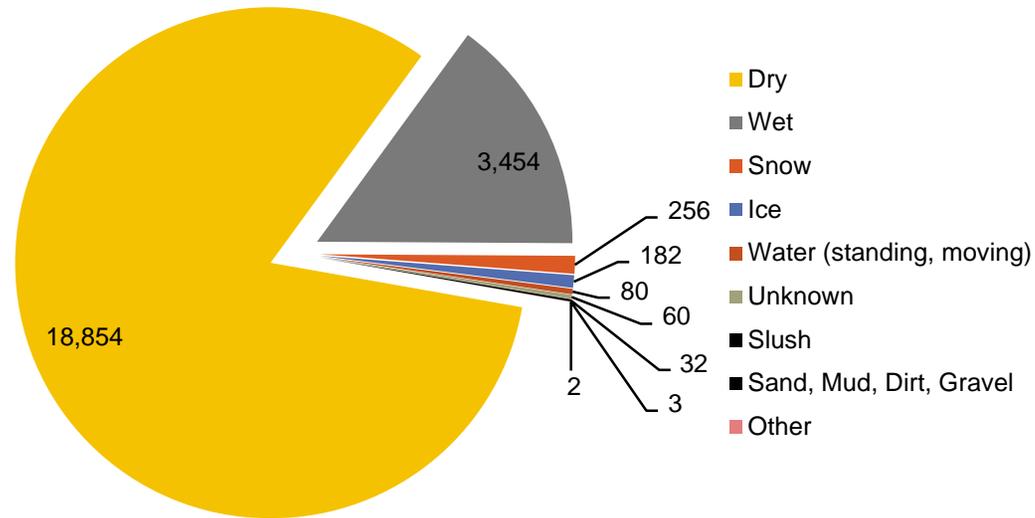


Total Number of Collisions by Ambient Light

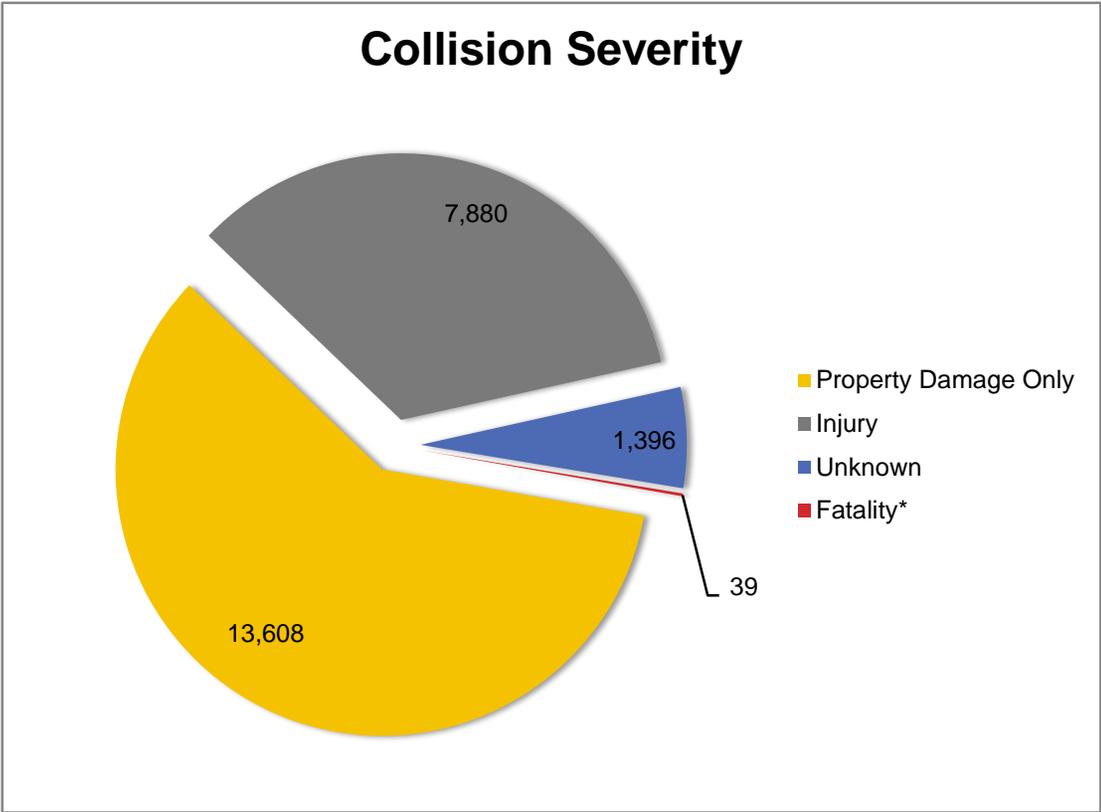


Type of Condition	Total Number of Collisions	Percent of Total
Daylight	16,170	70.54%
Dark - lighted roadway	4,513	19.69%
Dark - roadway not lighted	1,034	4.51%
Dusk	529	2.31%
Dawn	397	1.73%
Unknown	147	0.64%
Dark - unknown lighting	120	0.52%
Other	13	0.06%
Total	22,923	100%

Total Number of Crashes by Road Condition



Type of Condition	Total Number of Collisions	Percent of Total
Dry	18,854	82.25%
Wet	3,454	15.07%
Snow	256	1.12%
Ice	182	0.79%
Water (standing, moving)	80	0.35%
Unknown	60	0.26%
Slush	32	0.14%
Sand, Mud, Dirt, Gravel	3	0.01%
Other	2	0.01%
Total	22,923	100%



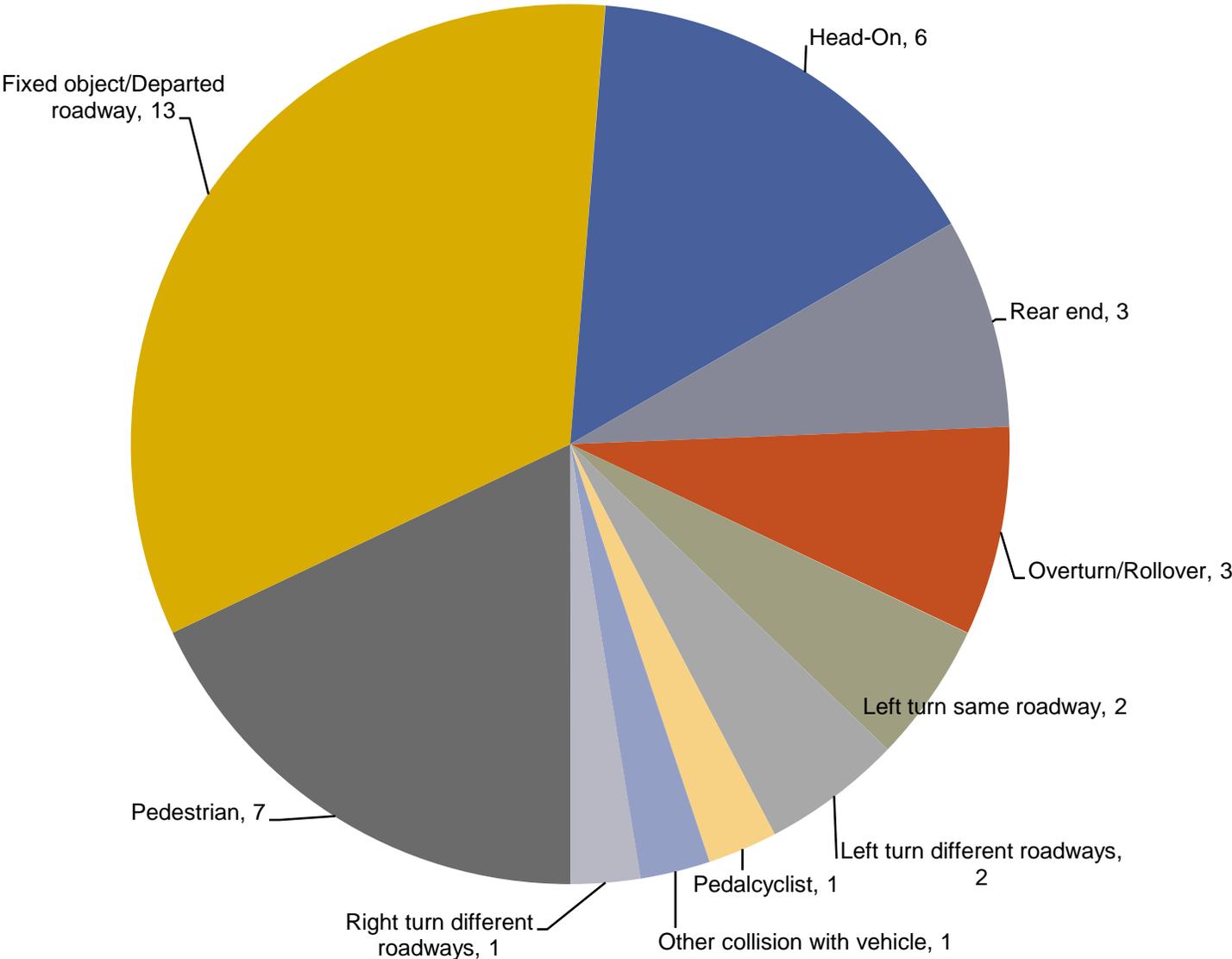
Injury Type	Total Collisions	Percent of Total
Property Damage Only	13,608	59.36%
Injury	7,880	34.38%
Unknown	1,396	6.09%
Fatality*	39	0.17%
Total	22,923	100.00%

* Fatal collisions considered reportable for Annual Report. Number may vary from Charlotte-Mecklenburg Police Department listings because the data presented in this report does not include collisions that occurred on the Interstate highways (I-77, I-277, I-85, and I-485) or collisions that occur within private lots and parking areas.

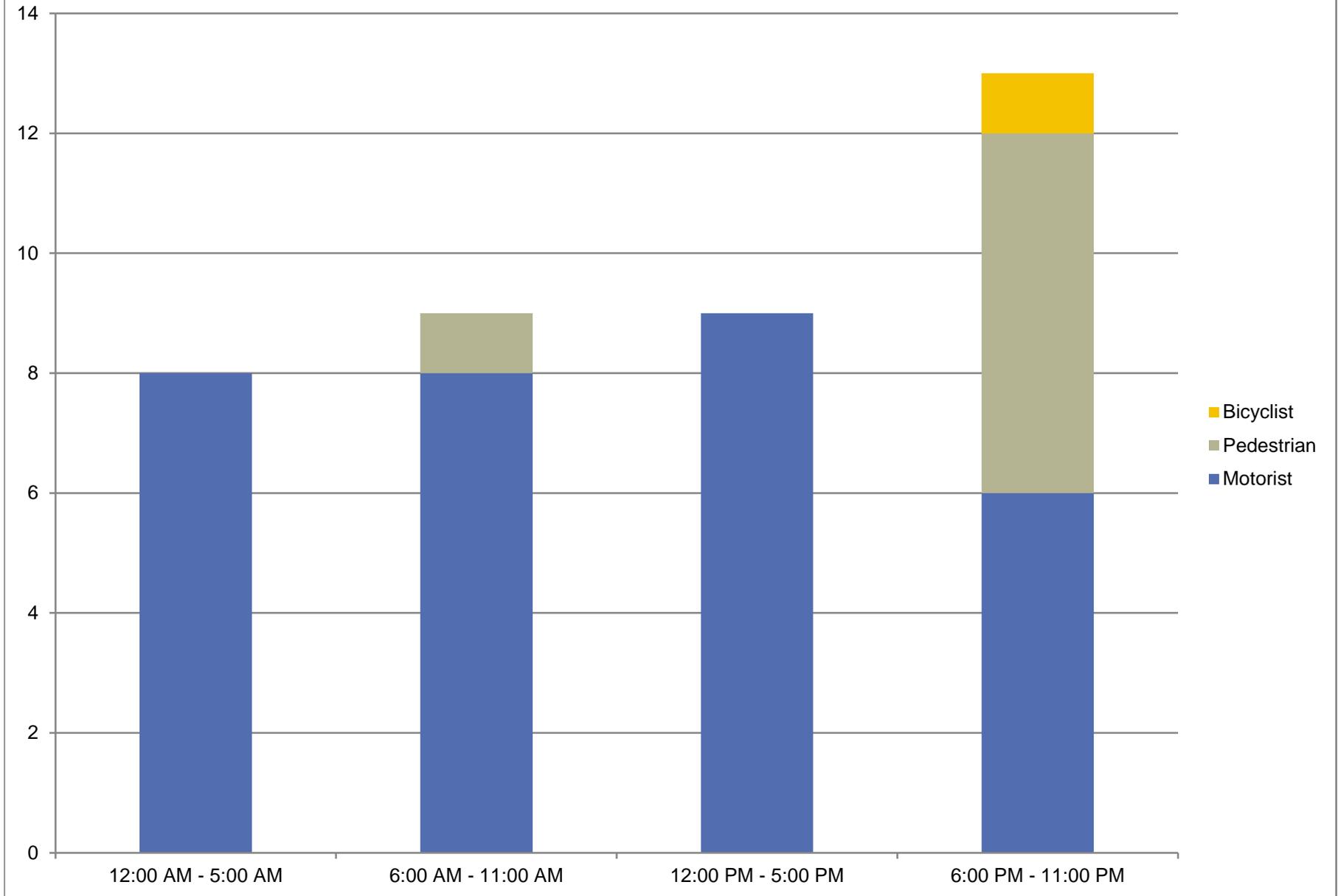
Contributing Circumstances	Total Collisions	Percent of Total
Inattention	4,872	21.25%
Failure to reduce speed	3,544	15.46%
No contributing circumstance indicated	3,425	14.94%
Failed to yield right of way	2,858	12.47%
Unable to determine	1,104	4.82%
Unknown	802	3.50%
Followed too closely	768	3.35%
Improper turn	704	3.07%
Improper lane change	660	2.88%
Disregarded traffic signals	643	2.81%
Other	473	2.06%
Exceeded safe speed for conditions	444	1.94%
Alcohol use	317	1.38%
Overcorrected/oversteered	280	1.22%
Improper backing	242	1.06%
Crossed centerline/going wrong way	203	0.89%
Visibility obstructed	188	0.82%
Exceeded authorized speed limit	170	0.74%
Disregarded stop sign	161	0.70%
Operated vehicle in erratic, reckless, careless, negligent or aggressive manner	160	0.70%
Swerved or avoided due to wind, slippery surface, vehicle, object, non-motorist	158	0.69%
Other improper passing	110	0.48%
Operated defective equipment	95	0.41%
Driver distracted by other inside the vehicle	86	0.38%
Disregarded road markings	70	0.31%
Driver distracted by electronic communication device (cell phone, texting, etc.	66	0.29%
Disregarded other traffic signs	60	0.26%
Use of improper lane	59	0.26%
Driver distracted by other electronic device (navigation device, DVD player, etc.	46	0.20%
Driver distracted by external distraction (outside the vehicle	45	0.20%
Disregarded yield sign	26	0.11%
Improper parking	24	0.10%
Right turn on red	23	0.10%
Drug use	21	0.09%
Improper or no signal	10	0.04%
Passed on curve	3	0.01%
Passed on hill	2	0.01%
Passed stopped school bus	1	0.00%
TOTAL	22,923	100.00%

2014 Collision Data

Crash Type



Fatal Collisions by Type and Time of Day



BICYCLIST

Crash Rates by Vehicle Miles Traveled						
YEAR	Total Bicycle Crashes	Bicycle Fatalities	Vehicle Miles Traveled	Bicycle Crash Rate Per Million Vehicle Miles	Bicycle Fatality Rate Per Million Vehicle Miles	Total Fatal Crashes
2002	98	1	17,699,261	5.54	0.06	48
2003	71	2	18,583,633	3.82	0.11	53
2004	105	1	20,095,648	5.23	0.05	39
2005	79	4	22,412,325	3.52	0.18	51
2006	92	1	22,343,242	4.12	0.04	63
2007	91	1	22,516,834	4.04	0.04	52
2008	114	4	22,051,666	5.17	0.18	42
2009	83	1	20,333,841	4.08	0.05	40
2010	95	2	19,717,761	4.82	0.10	29
2011	90	0	19,101,681	4.71	0.00	38
2012	112	1	19,552,898	5.73	0.05	44
2013	101	2	19,753,300	5.11	0.10	43
2014	140	1	20,211,400	6.93	0.05	39

Crash Rates by Population						
YEAR	Total Bicycle Crashes	Bicycle Fatalities	Population	Bicycle Crash Rate Per 10,000 Persons	Bicycle Fatality Rate Per 10,000 Persons	Total Fatal Crashes
2002	98	1	579,684	1.69	0.02	48
2003	71	2	594,176	1.19	0.03	53
2004	105	1	614,330	1.71	0.02	39
2005	79	4	632,760	1.25	0.06	51
2006	92	1	640,270	1.44	0.02	63
2007	91	1	664,342	1.37	0.02	52
2008	114	4	674,752	1.69	0.06	42
2009	83	1	692,097	1.20	0.01	40
2010	95	2	731,424	1.30	0.03	29
2011	90	0	750,124	1.20	0.00	38
2012	112	1	772,627	1.45	0.01	44
2013	101	2	796,921	1.27	0.03	43
2014	140	1	809,958	1.73	0.01	39

PEDESTRIAN

Crash Rates by Vehicle Miles Traveled						
YEAR	Total Pedestrian Crashes	Pedestrian Fatalities	Vehicle Miles Traveled	Pedestrian Crash Rate Per Million Vehicle Miles	Pedestrian Fatality Rate Per Million Vehicle Miles	Total Fatal Crashes
2002	234	17	17,699,261	13.22	0.96	48
2003	271	8	18,583,633	14.58	0.43	53
2004	223	8	20,095,648	11.10	0.40	39
2005	198	7	22,412,325	8.83	0.31	51
2006	230	15	22,343,242	10.29	0.67	63
2007	311	11	22,516,834	13.81	0.49	52
2008	345	9	22,051,666	15.65	0.41	42
2009	297	11	20,333,841	14.61	0.54	40
2010	305	13	19,717,761	15.47	0.66	29
2011	352	18	19,101,681	18.43	0.94	38
2012	299	21	19,552,898	15.29	1.07	44
2013	317	9	19,753,300	16.05	0.46	43
2014	371	7	20,211,400	18.36	0.35	39

Crash Rates by Population						
YEAR	Total Pedestrian Crashes	Pedestrian Fatalities	Population	Pedestrian Crash Rate Per 10,000 Persons	Pedestrian Fatality Rate Per 10,000 Persons	Total Fatal Crashes
2002	234	17	579,684	4.04	0.29	48
2003	271	8	594,176	4.56	0.13	53
2004	223	8	614,330	3.63	0.13	39
2005	198	7	632,760	3.13	0.11	51
2006	230	15	640,270	3.59	0.23	63
2007	311	11	664,342	4.68	0.17	52
2008	345	9	674,752	5.11	0.13	42
2009	297	11	692,097	4.29	0.16	40
2010	305	13	731,424	4.17	0.18	29
2011	352	18	750,124	4.69	0.24	38
2012	299	21	772,627	3.87	0.27	44
2013	317	9	796,921	3.98	0.11	43
2014	371	7	809,958	4.58	0.09	39

2015 High Accident Location (HAL) List

CDOT releases the annual HAL list to accomplish multiple goals. The first goal of releasing the HAL is to prioritize and identify locations that can benefit from spot safety improvements that will reduce the number of collisions. The list is also used to support the ranking and prioritization needs of many transportation related programs. In addition by releasing this list to the public, it is intended to heighten road user awareness of locations that have an elevated collision rate.

HAL Calculation Methodology

The calculation for the HAL is as follows;

- Step 1. Select all intersections with 15 or more collisions in a 3 year period
- Step 2. Select any intersections not identified above having 5 or more collisions with 75% occurring in the current year (2014).
- Step 3. Calculate collision rates for all intersections meeting above criteria.
$$(C*1,000,000)/(V*N*365)$$
where;
C= 3 years' collisions
V= Intersection Volume
N= Number of years
- Step 4. Determine HAL cutoff, should be an even number and allow for at least 50 locations. The cutoff for 2008 data was a collision rate of 1.30. The cutoff for 2009, 2013 and 2014 data is a collision rate of 1.20. The cutoff for 2010, 2011, and 2012 data was 1.10.

Two versions of the HAL list are presented on the following pages: rank order and alphabetical by street name.

ID	Location	2012	2013	2014	3-Year Total	ADT	Crash Rate	Rank	Prior Year Rank	ADT Year	Notes
12038	E 8TH ST & N COLLEGE ST	10	2	7	19	6,100	2.84	1	1	2012	Sept 2013 - signs and markings per safety committee
12721	S CHURCH ST & W HILL ST_W JOHN BELK RA	7	11	13	31	10,600	2.67	2	4	EST	Jan 2015 - signs and markings following field review
11956	E 9TH ST & N COLLEGE ST	7	8	7	22	7,600	2.64	3	2	2012	2013 - backplates added
11693	E 12TH ST & N COLLEGE ST	9	7	5	21	7,800	2.46	4	12	2012	
12135	E 7TH ST & N COLLEGE ST	12	13	13	38	14,400	2.41	5	7	2012	
13600	3RD-4TH CONNECTOR ST & E 4TH ST N KINGS DR S KINGS DR	37	34	41	112	45,400	2.25	6	14	EST	Under consideration for split phase
8847	E SUGAR CREEK RD & N TRYON ST W SUGAR CREEK RD	38	44	63	145	64,000	2.07	7	15	2014	
12896	E 6TH ST & N MCDOWELL ST	11	20	10	41	18,300	2.05	8	9	2010	2014 - backplates installed
4061	DAVID COX RD & LAKEVIEW RD_OLD STATESVILLE RD	5	16	11	32	14,700	1.99	9	10	2013	Intersection improvement project/traffic signal awaiting funding
9902	CAMBRIDGE COMMONS DR & HARRISBURG RD	17	9	5	31	14,600	1.94	10	3	2013	Roundabout completed
5266	DOUG MAYES PL & J W CLAY BV	6	9	10	25	11,800	1.93	11	21	2013	
7380	REAGAN DR & W SUGAR CREEK RD	31	35	40	106	51,000	1.90	12	16	2014	
44555	N TRYON ST & UNIVERSITY CITY BV	26	55	46	127	61,400	1.89	13	Not Ranked	2012	
13590	CAMDEN RD & S TRYON ST W SUMMIT AV	8	13	10	31	15,200	1.86	14	35	2012	
8329	BEATTIES FORD RD & LASALLE ST	25	16	17	58	28,800	1.84	15	20	2013	
13912	CHARLOTTETOWNE AV & E JOHN BELK RA KENILWORTH AV	18	39	31	88	43,800	1.83	16	11	2012	2015 backplates added
11625	E 11TH ST & N COLLEGE ST	12	23	13	48	24,000	1.83	17	46	2013	2013 - backplates added + signs added
4698	LAWING RD & MIRANDA RD_OAKDALE RD SUNSET RD	4	8	10	22	11,400	1.76	18	8	2014	
12089	E 12TH ST & N DAVIDSON ST	11	15	17	43	22,300	1.76	19	51	2013	
12775	E 4TH ST & S CALDWELL ST	9	20	16	45	23,400	1.76	20	27	2013	
10100	ASHLEY RD & FREEDOM DR TUCKASEEGEE RD	31	22	25	78	40,900	1.74	21	6	2013	
21514	E ARROWOOD RD & NATIONS FORD RD W ARROWOOD RD	8	17	23	48	25,200	1.74	22	Not Ranked	2012	Intersection improvement project
12076	N CHURCH ST & W 5TH ST	9	10	13	32	16,800	1.74	23	18	2013	
12186	E 11TH ST & E BROOKSHIRE FR RA_N DAVIDSON ST	10	12	16	38	20,100	1.73	24	37	2013	Replaced 12"/8"/8" signal heads with all 12" plus backplates
15287	ALBEMARLE RD & N SHARON AMITY RD	39	37	53	129	70,200	1.68	25	45	2013	
8515	ATANDO AV & STATESVILLE AV	15	22	20	57	31,300	1.66	26	22	2013	
15195	ALBEMARLE RD & FARM POND LN	27	33	41	101	56,100	1.64	27	40	2013	
4270	N TRYON ST & SALOME CHURCH RD	12	23	17	52	29,000	1.64	28	Not Ranked	EST	
4866	E MALLARD CREEK CHURCH RD & N TRYON ST W MALLARD CREEK CHURCH RD	26	31	42	99	57,100	1.58	29	42	2013	
13667	E 7TH ST & HAWTHORNE LN	10	23	19	52	30,000	1.58	30	5	2014	
11237	N I-77 EXIT 10B RA & W TRADE ST	7	13	16	36	20,800	1.58	31	61	2013	2015 - backplates added
5704	E W T HARRIS BV & N TRYON ST W W T HARRIS BV	35	52	40	127	73,800	1.57	32	38	2012	
7195	REAGAN DR & TOM HUNTER RD	3	3	10	16	9,300	1.57	33	Not Ranked	2013	
52081	E W T HARRIS BV & LAWYERS RD	9	16	7	32	18,700	1.56	34	Not Ranked	2013	
10862	DALTON AV & N GRAHAM ST	14	10	9	33	19,300	1.56	35	Not Ranked	2013	
13763	CENTRAL AV & EASTWAY DR	18	35	37	90	53,100	1.55	36	24	2013	
12937	E W T HARRIS BV & HICKORY GROVE RD	25	26	37	88	52,100	1.54	37	Not Ranked	2014	
15542	CLANTON RD & N I-77 TO CLANTON RD RA NB	7	15	13	35	20,800	1.54	38	49	2012	
24549	I-485 RA & SOUTH BV	16	30	27	73	43,400	1.54	39	44	2014	
12347	S CHURCH ST & W 3RD ST	5	6	10	21	12,500	1.53	40	Not Ranked	2013	
11311	MILTON RD & N SHARON AMITY RD	16	18	19	53	31,600	1.53	41	13	2014	
51371	N SHOPPING CENTER DR & N TRYON ST UNIVERSITY POINTE BV	20	21	18	59	35,200	1.53	42	31	2012	
14442	CENTRAL AV & N SHARON AMITY RD	38	30	38	106	63,400	1.53	43	17	2015	
13517	BILLY GRAHAM PY & MORRIS FIELD DR	17	31	32	80	47,900	1.53	44	Not Ranked	2013	
31626	PLAZA WALK DR & THE PLAZA	7	15	21	43	26,100	1.50	45	Not Ranked	2012	NCDOT project is in bid phase
24904	PINEVILLE-MATTHEWS RD & PROVIDENCE RD	28	42	44	114	69,200	1.50	46	26	2012	
5525	J W CLAY BV & MCCULLOUGH DR W W T HARRIS BV	34	40	39	113	68,700	1.50	47	52	2012	
17151	E INDEPENDENCE BV & IDLEWILD RD	33	47	50	130	79,400	1.50	48	55	2011	
12695	E TRADE ST & N CALDWELL ST S CALDWELL ST	13	12	7	32	20,000	1.46	49	30	2013	
12863	E 3RD ST & S CALDWELL ST	10	14	8	32	20,200	1.45	50	43	2012	
4175	LAKEVIEW RD & STATESVILLE RD	4	8	7	19	12,000	1.45	51	47	2013	Under evaluation for signal
9768	EASTWAY DR & THE PLAZA	21	28	33	82	51,900	1.44	52	62	2014	
12806	E STONEWALL ST & S COLLEGE ST	11	15	10	36	22,800	1.44	53	Not Ranked	2012	
49037	I-485 RA & MOUNT HOLLY RD	10	5	11	26	16,600	1.43	54	Not Ranked	2011	
4364	N I-85 RA & W MALLARD CREEK CHURCH RD	18	29	15	62	40,000	1.42	55	Not Ranked	EST	2014 - new signal installed
6130	OLD CONCORD RD & SUTHER RD	7	13	11	31	20,000	1.42	56	Not Ranked	EST	
17273	BILLY GRAHAM PY & S TRYON ST W WOODLAWN RD	25	43	31	99	64,200	1.41	57	23	2013	
15253	ALBEMARLE RD & E W T HARRIS BV	30	43	39	112	73,800	1.39	58	33	2013	
11164	CAMP GREENE ST & FREEDOM DR	12	15	21	48	31,800	1.38	59	Not Ranked	2012	
5454	BACK CREEK CHURCH RD & PAVILION BV UNIVERSITY CITY BV	17	38	35	90	60,100	1.37	60	Not Ranked	2014	
7554	BACK CREEK CHURCH RD & ROCKY RIVER RD	4	7	9	20	13,600	1.34	61	Not Ranked	2012	
28015	LANCASTER HY & PROVIDENCE RD WEST	3	15	10	28	19,300	1.32	62	Not Ranked	2009	
9607	E SUGAR CREEK RD & N DAVIDSON ST	9	8	17	34	23,500	1.32	63	Not Ranked	?	
13985	CAMDEN RD & EAST BV WEST BV	6	10	9	25	17,400	1.31	64	Not Ranked	2012	
11232	BARRINGTON DR & MILTON RD	11	8	7	26	18,200	1.30	65	29	2014	
10162	E SUGAR CREEK RD & THE PLAZA	15	11	38	64	44,800	1.30	66	Not Ranked	2014	
16126	E W T HARRIS BV & IDLEWILD RD	15	26	24	65	45,500	1.30	67	Not Ranked	2012	
7441	W SUGAR CREEK RD & WILSON LN	6	9	10	25	17,600	1.30	68	41	?	

ID	Location	2012	2013	2014	3-Year Total	ADT	Crash Rate	Rank	Prior Year Rank	ADT Year	Notes
10622	MULBERRY CHURCH RD & QUEEN CITY DR	7	11	7	25	17,800	1.28	69	60	2013	
19825	BROWN-GRIER RD & SANDY PORTER RD W ARROWOOD RD	4	6	19	29	20,700	1.28	70	Not Ranked	2010	
25815	PINEVILLE-MATTHEWS RD & REA RD	22	32	33	87	62,500	1.27	71	Not Ranked	2014	
11262	EASTWAY DR & FRONTENAC AV SHAMROCK DR	13	27	30	70	50,400	1.27	72	59	2014	
17062	IDLEWILD RD & MONROE RD RAMA RD	12	20	22	54	38,900	1.27	73	Not Ranked	2011	
8193	E W T HARRIS BV & GRIER RD	22	29	31	82	60,100	1.25	74	Not Ranked	2010	
11322	N GRAHAM ST & W 10TH ST	9	11	13	33	24,200	1.25	75	Not Ranked	2013	
13343	CHARLOTTETOWNE AV & E 7TH ST E INDEPENDENCE BV	9	18	13	40	29,700	1.23	76	39	2012	
20766	I-485 RA & S TRYON ST	24	24	15	63	47,100	1.22	77	Not Ranked	2011	
15201	ALBEMARLE RD & LAWYERS RD	11	28	32	71	53,400	1.21	78	Not Ranked	2013	
8181	FREEDOM DR & TODDVILLE RD	5	9	5	19	14,300	1.21	79	28	2013	Freedom Dr construction complete
51369	IKEA BV & UNIVERSITY CITY BV	8	14	12	34	25,600	1.21	80	Not Ranked	2012	
11349	N DAVIDSON ST & PARKWOOD AV	4	11	14	29	21,900	1.21	81	Not Ranked	2010	
6473	MINERAL SPRINGS RD & N GRAHAM ST W SUGAR CREEK RD	11	14	21	46	34,900	1.20	82	Not Ranked	2014	
13118	CENTRAL AV & E 7TH ST N KINGS DR	9	20	28	57	43,300	1.20	83	Not Ranked	2014	Flashing yellow arrows in progress

ID	Location	2012	2013	2014	3-Year Total	ADT	Crash Rate	Rank	Prior Year Rank	ADT Year	Notes
13600	3RD-4TH CONNECTOR ST & E 4TH ST N KINGS DR S KINGS DR	37	34	41	112	45,400	2.25	6	14	EST	Under consideration for split phase
15253	ALBEMARLE RD & E W T HARRIS BV	30	43	39	112	73,800	1.39	58	33	2013	
15195	ALBEMARLE RD & FARM POND LN	27	33	41	101	56,100	1.64	27	40	2013	
15201	ALBEMARLE RD & LAWYERS RD	11	28	32	71	53,400	1.21	78	Not Ranked	2013	
15287	ALBEMARLE RD & N SHARON AMITY RD	39	37	53	129	70,200	1.68	25	45	2013	
10100	ASHLEY RD & FREEDOM DR TUCKASEEGEE RD	31	22	25	78	40,900	1.74	21	6	2013	
8515	ATANDO AV & STATESVILLE AV	15	22	20	57	31,300	1.66	26	22	2013	
5454	BACK CREEK CHURCH RD & PAVILION BV UNIVERSITY CITY BV	17	38	35	90	60,100	1.37	60	Not Ranked	2014	
7554	BACK CREEK CHURCH RD & ROCKY RIVER RD	4	7	9	20	13,600	1.34	61	Not Ranked	2012	
11232	BARRINGTON DR & MILTON RD	11	8	7	26	18,200	1.30	65	29	2014	
8329	BEATTIES FORD RD & LASALLE ST	25	16	17	58	28,800	1.84	15	20	2013	
13517	BILLY GRAHAM PY & MORRIS FIELD DR	17	31	32	80	47,900	1.53	44	Not Ranked	2013	
17273	BILLY GRAHAM PY & S TRYON ST W WOODLAWN RD	25	43	31	99	64,200	1.41	57	23	2013	
19825	BROWN-GRIER RD & SANDY PORTER RD W ARROWOOD RD	4	6	19	29	20,700	1.28	70	Not Ranked	2010	
9902	CAMBRIDGE COMMONS DR & HARRISBURG RD	17	9	5	31	14,600	1.94	10	3	2013	Roundabout completed
13985	CAMDEN RD & EAST BV WEST BV	6	10	9	25	17,400	1.31	64	Not Ranked	2012	
13590	CAMDEN RD & S TRYON ST W SUMMIT AV	8	13	10	31	15,200	1.86	14	35	2012	
11164	CAMP GREENE ST & FREEDOM DR	12	15	21	48	31,800	1.38	59	Not Ranked	2012	
13118	CENTRAL AV & E 7TH ST N KINGS DR	9	20	28	57	43,300	1.20	83	Not Ranked	2014	Flashing yellow arrows in progress
13763	CENTRAL AV & EASTWAY DR	18	35	37	90	53,100	1.55	36	24	2013	
14442	CENTRAL AV & N SHARON AMITY RD	38	30	38	106	63,400	1.53	43	17	2015	
13343	CHARLOTTETOWNE AV & E 7TH ST E INDEPENDENCE BV	9	18	13	40	29,700	1.23	76	39	2012	
13912	CHARLOTTETOWNE AV & E JOHN BELK RA KENILWORTH AV	18	39	31	88	43,800	1.83	16	11	2012	2015 backplates added
15542	CLANTON RD & N I-77 TO CLANTON RD RA NB	7	15	13	35	20,800	1.54	38	49	2012	
10862	DALTON AV & N GRAHAM ST	14	10	9	33	19,300	1.56	35	Not Ranked	2013	
4061	DAVID COX RD & LAKEVIEW RD_OLD STATESVILLE RD	5	16	11	32	14,700	1.99	9	10	2013	Intersection improvement project/traffic signal awaiting funding
5266	DOUG MAYES PL & J W CLAY BV	6	9	10	25	11,800	1.93	11	21	2013	
12186	E 11TH ST & E BROOKSHIRE FR RA_N DAVIDSON ST	10	12	16	38	20,100	1.73	24	37	2013	Replaced 12"/8"/8" signal heads with all 12" plus backplates
11625	E 11TH ST & N COLLEGE ST	12	23	13	48	24,000	1.83	17	46	2013	2013 - backplates added + signs added
11693	E 12TH ST & N COLLEGE ST	9	7	5	21	7,800	2.46	4	12	2012	
12089	E 12TH ST & N DAVIDSON ST	11	15	17	43	22,300	1.76	19	51	2013	
12863	E 3RD ST & S CALDWELL ST	10	14	8	32	20,200	1.45	50	43	2012	
12775	E 4TH ST & S CALDWELL ST	9	20	16	45	23,400	1.76	20	27	2013	
12896	E 6TH ST & N MCDOWELL ST	11	20	10	41	18,300	2.05	8	9	2010	2014 - backplates installed
13667	E 7TH ST & HAWTHORNE LN	10	23	19	52	30,000	1.58	30	5	2014	
12135	E 7TH ST & N COLLEGE ST	12	13	13	38	14,400	2.41	5	7	2012	
12038	E 8TH ST & N COLLEGE ST	10	2	7	19	6,100	2.84	1	1	2012	Sept 2013 - signs and markings per safety committee
11956	E 9TH ST & N COLLEGE ST	7	8	7	22	7,600	2.64	3	2	2012	2013 - backplates added
21514	E ARROWOOD RD & NATIONS FORD RD W ARROWOOD RD	8	17	23	48	25,200	1.74	22	Not Ranked	2012	Intersection improvement project
17151	E INDEPENDENCE BV & IDLEWILD RD	33	47	50	130	79,400	1.50	48	55	2011	
4866	E MALLARD CREEK CHURCH RD & N TRYON ST W MALLARD CREEK CHURCH RD	26	31	42	99	57,100	1.58	29	42	2013	
12806	E STONEWALL ST & S COLLEGE ST	11	15	10	36	22,800	1.44	53	Not Ranked	2012	
9607	E SUGAR CREEK RD & N DAVIDSON ST	9	8	17	34	23,500	1.32	63	Not Ranked	?	
8847	E SUGAR CREEK RD & N TRYON ST W SUGAR CREEK RD	38	44	63	145	64,000	2.07	7	15	2014	
10162	E SUGAR CREEK RD & THE PLAZA	15	11	38	64	44,800	1.30	66	Not Ranked	2014	
12695	E TRADE ST & N CALDWELL ST S CALDWELL ST	13	12	7	32	20,000	1.46	49	30	2013	
8193	E W T HARRIS BV & GRIER RD	22	29	31	82	60,100	1.25	74	Not Ranked	2010	
12937	E W T HARRIS BV & HICKORY GROVE RD	25	26	37	88	52,100	1.54	37	Not Ranked	2014	
16126	E W T HARRIS BV & IDLEWILD RD	15	26	24	65	45,500	1.30	67	Not Ranked	2012	
52081	E W T HARRIS BV & LAWYERS RD	9	16	7	32	18,700	1.56	34	Not Ranked	2013	
5704	E W T HARRIS BV & N TRYON ST W W T HARRIS BV	35	52	40	127	73,800	1.57	32	38	2012	
11262	EASTWAY DR & FRONTENAC AV SHAMROCK DR	13	27	30	70	50,400	1.27	72	59	2014	
9768	EASTWAY DR & THE PLAZA	21	28	33	82	51,900	1.44	52	62	2014	
8181	FREEDOM DR & TODDVILLE RD	5	9	5	19	14,300	1.21	79	28	2013	Freedom Dr construction complete
49037	I-485 RA & MOUNT HOLLY RD	10	5	11	26	16,600	1.43	54	Not Ranked	2011	
20766	I-485 RA & S TRYON ST	24	24	15	63	47,100	1.22	77	Not Ranked	2011	
24549	I-485 RA & SOUTH BV	16	30	27	73	43,400	1.54	39	44	2014	
17062	IDLEWILD RD & MONROE RD RAMA RD	12	20	22	54	38,900	1.27	73	Not Ranked	2011	
51369	IKEA BV & UNIVERSITY CITY BV	8	14	12	34	25,600	1.21	80	Not Ranked	2012	
5525	J W CLAY BV & MCCULLOUGH DR W W T HARRIS BV	34	40	39	113	68,700	1.50	47	52	2012	
4175	LAKEVIEW RD & STATESVILLE RD	4	8	7	19	12,000	1.45	51	47	2013	Under evaluation for signal
28015	LANCASTER HY & PROVIDENCE RD WEST	3	15	10	28	19,300	1.32	62	Not Ranked	2009	
4698	LAWING RD & MIRANDA RD OAKDALE RD SUNSET RD	4	8	10	22	11,400	1.76	18	8	2014	
11311	MILTON RD & N SHARON AMITY RD	16	18	19	53	31,600	1.53	41	13	2014	
6473	MINERAL SPRINGS RD & N GRAHAM ST W SUGAR CREEK RD	11	14	21	46	34,900	1.20	82	Not Ranked	2014	
10622	MULBERRY CHURCH RD & QUEEN CITY DR	7	11	7	25	17,800	1.28	69	60	2013	
12076	N CHURCH ST & W 5TH ST	9	10	13	32	16,800	1.74	23	18	2013	
11349	N DAVIDSON ST & PARKWOOD AV	4	11	14	29	21,900	1.21	81	Not Ranked	2010	
11322	N GRAHAM ST & W 10TH ST	9	11	13	33	24,200	1.25	75	Not Ranked	2013	

ID	Location	2012	2013	2014	3-Year Total	ADT	Crash Rate	Rank	Prior Year Rank	ADT Year	Notes
11237	N I-77 EXIT 10B RA & W TRADE ST	7	13	16	36	20,800	1.58	31	61	2013	2015 - backplates added
4364	N I-85 RA & W MALLARD CREEK CHURCH RD	18	29	15	62	40,000	1.42	55	Not Ranked	EST	2014 - new signal installed
51371	N SHOPPING CENTER DR & N TRYON ST UNIVERSITY POINTE BV	20	21	18	59	35,200	1.53	42	31	2012	
4270	N TRYON ST & SALOME CHURCH RD	12	23	17	52	29,000	1.64	28	Not Ranked	EST	
44555	N TRYON ST & UNIVERSITY CITY BV	26	55	46	127	61,400	1.89	13	Not Ranked	2012	
6130	OLD CONCORD RD & SUTHER RD	7	13	11	31	20,000	1.42	56	Not Ranked	EST	
24904	PINEVILLE-MATTHEWS RD & PROVIDENCE RD	28	42	44	114	69,200	1.50	46	26	2012	
25815	PINEVILLE-MATTHEWS RD & REA RD	22	32	33	87	62,500	1.27	71	Not Ranked	2014	
31626	PLAZA WALK DR & THE PLAZA	7	15	21	43	26,100	1.50	45	Not Ranked	2012	NCDOT project is in bid phase
7195	REAGAN DR & TOM HUNTER RD	3	3	10	16	9,300	1.57	33	Not Ranked	2013	
7380	REAGAN DR & W SUGAR CREEK RD	31	35	40	106	51,000	1.90	12	16	2014	
12347	S CHURCH ST & W 3RD ST	5	6	10	21	12,500	1.53	40	Not Ranked	2013	
12721	S CHURCH ST & W HILL ST_W JOHN BELK RA	7	11	13	31	10,600	2.67	2	4	EST	Jan 2015 - signs and markings following field review
7441	W SUGAR CREEK RD & WILSON LN	6	9	10	25	17,600	1.30	68	41	?	

2014 Intersection Safety Warrant List

As part of the Charlotte Department of Transportation's goal of providing a safe transportation system for all road users, the Traffic Safety Section has developed a list of locations that have promise as sites for safety improvements. Additionally, this list provides a more stable picture of the collision patterns at locations throughout the City to aid in the development of capital projects and programs. City of Charlotte staff is the primary user of this information; however, other transportation professionals may find the information helpful in developing projects and programs. The warrant list will be updated every 2 years.

The following are a few key points regarding the warrant list that may be helpful to non-primary users of this information:

- The locations are selected and prioritized using many crash related factors. Some of the factors include frequency, rate, severity and crash pattern.
- This listing is not based strictly on highest rate, injuries or frequency. Thus it is not an effort to list "the most dangerous locations."
- The locations listed in this publication are only preliminary candidates for safety improvements. The final decision to install safety countermeasures at a location will depend upon the findings of a detailed engineering investigation, the availability of funds and other various factors.

Intersection Safety Warrants Selection Criteria

Warrant I-1: Frontal Impact

Locations with a minimum of 25 total collisions AND a minimum of 50% of all crashes were frontal impact crashes AND a minimum of 25% of the total crashes occurred in the last 2 years. Frontal impact crashes are defined as:

- o Angle
- o Left Turn (same or different roadways)
- o Right Turn (same or different roadways)
- o Head On

Warrant I-2: Last Year Increase

Locations with a minimum of 25 total crashes AND a minimum of 38% of the total crashes occurred during the last year.

Warrant I-3: Frequency with a Severity Index Minimum

Tier 1: Locations with a minimum of 25 total crashes AND a minimum severity index of 7.0 AND a minimum of 40% of the collisions involving injury.

Tier 2: Locations with a minimum of 10 total crashes AND a minimum severity index of 8.0 AND a minimum of 50% of the collisions involving injury.

Severity index of a location is equal to the total equivalent property damage only (EPDO) collisions divided by the total number of collisions. EPDO is calculated as follows;

$$(76.8*(K+A)) + (8.4*(B+C)) + (O+U)$$

Where

K=Fatal collisions

A=Disabling injury collisions

B=Evident injury

collisions C=Possible

injury collisions O=No

injury collisions

U=Unknown injury

collisions

Warrant I-4: Night Locations without Streetlights (Officer indicated)

Locations with a minimum of 25% of the total crashes occurring in the last 2 years AND locations with a minimum of 12 crash that occurred at night.

Warrant I-5: Chronic Pattern

This warrant only applies to locations that did not meet the conditions of Warrants 1-4

Locations with a minimum of 20 crashes during 10 years, 15% of the total crashes occurring in the last 3 years AND a minimum of 80% of the total crashes were in one of the following pattern categories:

- o Rear End (all rear end crash types)
- o Crossing (all left turn, angle, and head on crash types)

Warrant P-1: Last 3 Years (Pedestrians)

Locations with a minimum of 4 crashes involving pedestrians reported in the last 10 years AND a minimum of 45% of all crashes involving pedestrians happened in the last 3 years.

Warrant P-2: Darkness with Streetlights (Pedestrians)

Locations with a minimum of 4 crashes involving pedestrians reported in the last 10 years AND a minimum of 55% of all crashes involving pedestrians occurred during darkness with streetlights.

Warrant P-3: Alcohol Involvement (Pedestrians)

Locations with a minimum of 4 crashes involving pedestrians reported in the last 10 years AND a minimum of 30% of all crashes involving pedestrians must have involved alcohol.

Warrant P-4: Chronic Location (Pedestrians)

Locations with a minimum of 6 crashes involving pedestrians reported in the last 10 years.

Warrant X-1: Last 3 Years (Bicyclists)

Locations with a minimum of 3 crashes involving bicyclists reported in the last 10 years AND a minimum of 45% of all crashes involving bicyclists happened in the last 3 years.

Warrant X-2: Darkness with Streetlights (Bicyclists)

Locations with a minimum of 3 crashes involving bicyclists reported in the last 10 years AND a minimum of 55% of all crashes involving bicyclists occurred during darkness with streetlights.

Warrant X-3: Alcohol Involvement (Bicyclists)

Locations with a minimum of 3 crashes involving bicyclists reported in the last 10 years AND a minimum of 30% of all crashes involving bicyclists must have involved alcohol.

Warrant X-4: Chronic Location (Bicyclists)

Locations with a minimum of 4 crashes involving bicyclists reported in the last 10 years.

ID	Location	Signalized	5-Year Collisions Total	Intersection Warrants					Pedestrian and Bike Warrants					
				Frontal Impact	Last Year Increase	Severity	Night	Chronic	Last 3 Years Peds	Night Peds	P-4	Last 3 Years Bike	X-4	
13864	3RD-4TH CONNECTOR ST & CHARLOTTE TOWNE AV E 3RD ST	Yes	84	X										
13600	3RD-4TH CONNECTOR ST & E 4TH ST N KINGS DR S KINGS DR	Yes	180	X										
13090	ALBEMARLE RD & BLAIR RD	Yes	49	X										
13117	ALBEMARLE RD & CABARRUS RD	No	26	X										
15117	ALBEMARLE RD & CENTRAL AV	No	24							X	X			
44421	ALBEMARLE RD & CENTRAL AV	Yes	93	X										
14364	ALBEMARLE RD & DWIGHTWARE BV	No	16					X						
15173	ALBEMARLE RD & EXECUTIVE CENTER DR JENKINS DR	Yes	101						X	X				
15195	ALBEMARLE RD & FARM POND LN	Yes	152							X	X			
45596	ALBEMARLE RD & I-485 RA	Yes	35	X										
15287	ALBEMARLE RD & N SHARON AMITY RD	Yes	179						X	X				
15243	ALBEMARLE RD & REGAL OAKS DR	Yes	90						X		X			
14746	ALBEMARLE RD & WILGROVE-MINT HILL RD	Yes	35	X										
15217	ALBEMARLE RD & WINTERHAVEN DR	Yes	79						X		X			
23744	ALEXANDER RD & PINEVILLE-MATTHEWS RD	Yes	28	X										
27113	ALEXANDER VALLEY DR & PROVIDENCE RD	No	26	X										
2981	ALEXANDERANA RD & EASTFIELD RD OLD STATESVILLE RD	Yes	39	X										
12144	ALLEGHANY ST & WILKINSON BV	No	39	X										
24827	ARBORETUM DR & PINEVILLE-MATTHEWS RD	No	33	X										
30550	ARBORETUM SHOPPING CENTER DR & PROVIDENCE RD	Yes	46	X										
25033	ARBORETUM VIEW & PINEVILLE-MATTHEWS RD	Yes	50	X										
19953	ARCHDALE DR & OLD PINEVILLE RD	Yes	35		X									
28184	ARDREY KELL RD & BLAKENEY HEATH RD BLAKENEY PROFESSIONAL DR	No	16					X						
48197	ARDREY KELL RD & BLAKENEY PARK DR	No	25	X										
28381	ARDREY KELL RD & HAWFIELD WAY DR	No	22					X						
13568	ARLINGTON AV & S CALDWELL ST SOUTH BV	No	25	X										
12954	ARNOLD DR & EASTWAY DR	No	31			X								
21338	ARROWRIDGE BV & N I-77 EXIT 3 RA W ARROWOOD RD	No	28	X										
12216	ASHLEY RD & LUMINA AV	No	21			X								
16859	ASHMORE DR & MONROE RD	No	24			X								
8534	ATANDO AV & LASALLE ST N I-77 EXIT 12 RA	Yes	30	X										
8515	ATANDO AV & STATESVILLE AV	Yes	94	X										
9905	ATMORE ST & E SUGAR CREEK RD	No	26		X									
10012	ATMORE ST & THE PLAZA	No	34	X	X	X								
11011	AUDREY ST & EASTWAY DR	No	35			X								
8041	AUSTIN DR & N TRYON ST	No	40	X										
5454	BACK CREEK CHURCH RD & PAVILION BV UNIVERSITY CITY BV	Yes	122				X							
7554	BACK CREEK CHURCH RD & ROCKY RIVER RD	No	28	X										
27432	BALLANTYNE COMMONS PY & DURANT BV JOHN J DELANEY DR	No	33	X										
27468	BALLANTYNE COMMONS PY & JOHN J DELANEY DR	No	38	X										
27495	BALLANTYNE COMMONS PY & NORTH COMMUNITY HOUSE RD	Yes	37	X										
27228	BALLANTYNE COMMONS PY & TOM SHORT RD	Yes	17					X						
5574	BANNER ELK DR & SUNSET RD	No	42	X	X									
11232	BARRINGTON DR & MILTON RD	No	38	X		X								
5199	BARTON CREEK DR & N TRYON ST	No	25	X										
13761	BAY ST & PECAN AV	No	10			X								
26068	BAYBROOK LN & PINEVILLE-MATTHEWS RD	Yes	36	X										
9278	BEATTIES FORD RD & BOOKER AV OAKLAWN AV	Yes	41	X		X								
8204	BEATTIES FORD RD & CATHERINE SIMMONS AV	No	43	X							X			
6943	BEATTIES FORD RD & CINDY LN GRIERS GROVE RD	Yes	38	X					X					

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43131	BEATTIES FORD RD & DR WEBBER AV	No	11								X			
9995	BEATTIES FORD RD & FRENCH ST	Yes	30	X										
7885	BEATTIES FORD RD & GILBERT ST_MONTANA DR	Yes	49							X				
8329	BEATTIES FORD RD & LASALLE ST	Yes	80									X		
9358	BEATTIES FORD RD & SANDERS AV	No	12								X			
5672	BEATTIES FORD RD & SUNSET RD	Yes	76	X										
9432	BEATTIES FORD RD & W BROOKSHIRE RA	Yes	17					X						
4743	BELLHAVEN BV & MT HOLLY-HUNTERSVILLE RD_ROZZELLES FERRY RD	Yes	38	X										
8889	BENNETT ST & N TRYON ST	No	33	X										
11538	BERRYHILL RD & FREEDOM DR	Yes	35							X				
26468	BEVINGTON PL & REA RD	Yes	28	X										
8895	BINGHAM DR & N TRYON ST	No	27	X										
24416	BIRNEN DR & JOHNSTON RD_PARK RD	Yes	39		X									
42482	BLAKENEY GREENS BV & REA RD	No	31	X										
5104	BONNIE CONE LN & E MALLARD CREEK CHURCH RD_MARY ALEXANDER RD	Yes	29	X										
8132	BRANCH HILL CR & OLD CONCORD RD	No	10			X								
14396	BRIAR CREEK RD & COMMONWEALTH AV	Yes	25	X										
7969	BROOKSHIRE BV & N HOSKINS RD	Yes	96								X			
8535	BROOKSHIRE BV & NELSON AV	No	44	X										
5338	BROOKSHIRE BV & PLEASANT GROVE RD	Yes	30	X										
19825	BROWN-GRIER RD & SANDY PORTER RD_W ARROWOOD RD	Yes	46	X	X									
17435	BUICK DR & CONFERENCE DR_E INDEPENDENCE BV	Yes	43								X			
13985	CAMDEN RD & EAST BV_WEST BV	Yes	37	X										
5606	CAMERON BV & JOHN KIRK DR	No	25					X						
15085	CAMPBELL DR & N SHARON AMITY RD	No	29	X										
26209	CARMEL RD & JOHNSTON RD	Yes	48	X										
21348	CARMEL RD & SHARON VIEW RD	Yes	31	X	X									
23277	CAROWINDS BV & JOHN PRICE RD_S TRYON ST	Yes	80							X				
17597	CASTLETON RD & N SHARON AMITY RD	No	11			X								
17169	CEDARS EAST CT & IDLEWILD RD	No	29	X										
13118	CENTRAL AV & E 7TH ST_N KINGS DR	Yes	77	X										
13541	CENTRAL AV & EASTCREST DR	Yes	22									X		
13763	CENTRAL AV & EASTWAY DR	Yes	151									X		
13007	CENTRAL AV & HAWTHORNE LN	Yes	38	X										
13009	CENTRAL AV & INDEPENDENCE/I-277 RA	No	46		X									
14442	CENTRAL AV & N SHARON AMITY RD	Yes	154									X		
43116	CENTRAL AV & PECAN AV	No	38							X		X		
14213	CENTRAL AV & ROSEHAVEN DR	Yes	51									X		
13588	CENTRAL AV & WEMBLEY DR	No	22									X		
13787	CHARLOTTETOWNE AV & E 4TH ST	Yes	50	X										
13343	CHARLOTTETOWNE AV & E 7TH ST_E INDEPENDENCE BV	Yes	80	X										
13912	CHARLOTTETOWNE AV & E JOHN BELK RA_KENILWORTH AV	Yes	134	X										
13683	CHARLOTTETOWNE AV & ELIZABETH AV	Yes	37									X		
50041	CHARLOTTETOWNE AV & METROPOLITAN AV	No	40	X										
15125	CHEROKEE RD & PROVIDENCE RD	Yes	65	X						X		X		
6882	CINDY LN & STATESVILLE RD	Yes	31		X									
10134	CITISIDE DR & EASTWAY DR_WELDON AV	No	28	X										
44552	CITY BVXN I85 RA NB & UNIVERSITY CITY BV	No	28	X	X				X					
15542	CLANTON RD & N I-77 TO CLANTON RD RA NB	Yes	50	X										

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				Frontal Impact	Last Year Increase	Severity	Night	Chronic	Last 3 Years Peds	Night Peds	P-4	Last 3 Years Bike	X-4	
42582	COLLEGE-TRYON ST & N TRYON ST	No	18			X								
27388	CONLAN CR & DON LOCHMAN LN JOHN J DELANEY DR	No	45	X										
26590	COUNTRY LN & PROVIDENCE RD	Yes	19			X								
20634	COVEDALE DR & MONROE RD	No	26	X		X								
23690	GRESSIDA DR & E WESTINGHOUSE BV SOUTH BV	Yes	50		X									
4061	DAVID COX RD & LAKEVIEW RD OLD STATESVILLE RD	No	46	X										
14136	DELTA CROSSING LN & E W T HARRIS BV	No	11			X								
13946	DILWORTH RD & E MOREHEAD ST	No	10			X								
14844	DILWORTH RD WEST & EAST BV	Yes	13			X								
5266	DOUG MAYES PL & J W CLAY BV	No	34	X										
23795	DOWNS RD & E WESTINGHOUSE BV	Yes	27	X		X								
3912	DRIWOOD CT & PROSPERITY CHURCH RD	No	24					X						
14965	DUNN AV & MONROE RD	Yes	14			X								
11974	E 11TH ST & E BROOKSHIRE FR RA N BREVARD ST	Yes	31		X									
12186	E 11TH ST & E BROOKSHIRE FR RA N DAVIDSON ST	Yes	55	X										
12073	E 11TH ST & N CALDWELL ST	Yes	37	X										
11625	E 11TH ST & N COLLEGE ST	Yes	67	X										
11677	E 11TH ST & N TRYON ST W 11TH ST	Yes	42	X										
11693	E 12TH ST & N COLLEGE ST	Yes	25	X										
12089	E 12TH ST & N DAVIDSON ST	Yes	57						X					
11717	E 15TH ST & N DAVIDSON ST	No	6						X	X				
10030	E 28TH ST & N TRYON ST W 28TH ST	Yes	44			X								
9356	E 36TH ST & N TRYON ST	Yes	37										X	
10772	E 36TH ST & THE PLAZA	Yes	41			X				X	X			
13430	E 3RD ST & E JOHN BELK RA	Yes	37	X										
42643	E 3RD ST & E JOHN BELK RA	Yes	41	X										
14371	E 3RD ST & PROVIDENCE RD S CASWELL RD	Yes	43	X										
14249	E 3RD ST & QUEENS RD	Yes	38	X		X								
12863	E 3RD ST & S CALDWELL ST	Yes	50	X										
13696	E 3RD ST & S KINGS DR	Yes	51	X										
13994	E 3RD ST & S TORRENCE ST	No	33	X										
13302	E 4TH ST & E JOHN BELK RA	Yes	58	X										
42642	E 4TH ST & E JOHN BELK RA	Yes	37		X									
13881	E 4TH ST & N TORRENCE ST	No	27	X										
12775	E 4TH ST & S CALDWELL ST	Yes	70	X										
12492	E 4TH ST & S COLLEGE ST	Yes	37						X					
12868	E 4TH ST & S DAVIDSON ST	Yes	18								X			
13197	E 4TH ST & S MCDOWELL ST	Yes	56								X			
12377	E 4TH ST & S TRYON ST W 4TH ST	Yes	42								X			
12618	E 5TH ST & N CALDWELL ST	Yes	40	X										
12305	E 5TH ST & N COLLEGE ST	Yes	35	X										
12199	E 5TH ST & N TRYON ST W 5TH ST	Yes	18							X				
12220	E 6TH ST & N COLLEGE ST	Yes	28								X			
12896	E 6TH ST & N MCDOWELL ST	Yes	52	X										
12101	E 6TH ST & N TRYON ST W 6TH ST	Yes	37						X				X	
13667	E 7TH ST & HAWTHORNE LN	Yes	92	X										
12333	E 7TH ST & N BREVARD ST	Yes	25						X					
12135	E 7TH ST & N COLLEGE ST	Yes	50	X										
12527	E 7TH ST & N DAVIDSON ST	Yes	28	X										

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12809	E 7TH ST & N MCDOWELL ST	Yes	49	X										
12038	E 8TH ST & N COLLEGE ST	No	35	X										
11956	E 9TH ST & N COLLEGE ST	Yes	35	X										
11847	E 9TH ST & N TRYON ST_W 9TH ST	Yes	24						X			X		
7770	E ARROWHEAD DR & N TRYON ST_W ARROWHEAD DR	No	43	X		X						X		
21296	E ARROWOOD RD & ENGLAND ST_OLD PINEVILLE RD	Yes	32									X		
21514	E ARROWOOD RD & NATIONS FORD RD_W ARROWOOD RD	Yes	70						X					
21312	E ARROWOOD RD & SOUTH BV_STARBROOK DR	Yes	57									X		
13420	E BLAND ST & S TRYON ST_W BLAND ST	Yes	25	X										
18436	E INDEPENDENCE BV & SHARON FOREST DR	No	49	X	X									
18478	E INDEPENDENCE BV & WALLACE RD	No	76	X	X									
13158	E JOHN BELK RA & S CALDWELL ST	Yes	64	X					X					
47907	E MALLARD CREEK CHURCH RD & JOHN KIRK DR	Yes	25	X										
4866	E MALLARD CREEK CHURCH RD & N TRYON ST_W MALLARD CREEK CHURCH RD	Yes	158				X							
12548	E MARTIN LUTHER KING JR BV & S TRYON ST_W MARTIN LUTHER KING JR BV	Yes	17									X		
13057	E MOREHEAD ST & S COLLEGE ST_S TRYON/COLLEGE CONNECTOR ST	Yes	28	X										
12991	E MOREHEAD ST & S TRYON ST_W MOREHEAD ST	Yes	61	X										
13854	E PARK AV & SOUTH BV	Yes	42						X					
12806	E STONEWALL ST & S COLLEGE ST	Yes	43	X					X			X		
13579	E STONEWALL ST & S MCDOWELL ST	Yes	40	X										
12711	E STONEWALL ST & S TRYON ST_W STONEWALL ST	Yes	45	X										
8847	E SUGAR CREEK RD & N TRYON ST_W SUGAR CREEK RD	Yes	205										X	
12695	E TRADE ST & N CALDWELL ST_S CALDWELL ST	Yes	48	X										
12396	E TRADE ST & N COLLEGE ST_S COLLEGE ST	Yes	56									X		
12285	E TRADE ST & N TRYON ST_S TRYON ST_W TRADE ST	Yes	45								X	X		
14314	E TREMONT AV & SOUTH BV	Yes	48						X					
8193	E W T HARRIS BV & GRIER RD	Yes	125				X							
52081	E W T HARRIS BV & LAWYERS RD	No	41					X						
13422	E W T HARRIS BV & TRYSTING RD	No	30		X									
6328	E W T HARRIS RA & UNIVERSITY CITY BV	Yes	39		X									
23784	E WESTINGHOUSE BV & NATIONS FORD RD_WESTINGHOUSE BV	Yes	23			X								
17555	E WOODLAWN RD & OLD PINEVILLE RD	Yes	52	X										
18337	E WOODLAWN RD & RUNNYMEDE LN_SELWYN AV	Yes	46	X										
15139	EAST BV & KENILWORTH AV	Yes	48	X					X					
14078	EAST BV & SOUTH BV	Yes	96						X					
12293	EASTWAY DR & KILBORNE DR	Yes	48									X		
11103	EASTWAY DR & MICHIGAN AV	No	30		X	X								
9768	EASTWAY DR & THE PLAZA	Yes	121									X		
14629	EASTWAY DR & WOODLAND DR	Yes	30	X										
9974	EDGEWOOD RD & QUEEN CITY DR_TUCKASEEGEE RD	Yes	22			X								
13389	ELIZABETH AV & N KINGS DR	Yes	40									X		
26038	ELM LN & PINEVILLE-MATTHEWS RD	Yes	35	X										
7190	EQUIPMENT DR & N GRAHAM ST	No	18			X								
7094	EQUIPMENT DR & W SUGAR CREEK RD	No	30	X										
23038	ERWIN RD & STEELE CREEK RD	No	31	X										
47164	FAIRVIEW RD & SOUTH PARK DR	No	62	X	X				X					
48851	FINCHER FARM RD & WEDDINGTON RD	No	10			X								
27211	FORBES DR & PROVIDENCE RD	No	15					X						

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11105	FRAZIER AV & W TRADE ST	No	14			X								
9140	FREEDOM DR & THRIFTWOOD DR	No	15			X								
21797	GALLERIA BV & MONROE RD	Yes	29	X										
21209	GALLERIA BV & SARDIS RD NORTH	Yes	27	X										
30513	GENERAL DR & S TRYON ST_YORK CENTER DR	No	44	X										
5919	GIBBON RD & NEVIN RD	Yes	32	X										
43380	GILEAD RD & I-77 TO GILEAD RD RA NB	No	31		X									
2069	GILEAD RD & N STATESVILLE RD_S STATESVILLE RD	No	35		X									
2115	GILEAD RD & REESE BV	No	15			X								
23329	GLENEAGLES RD & PARK RD_SHARON RD WEST	Yes	46		X									
18963	GROVER RD & SOUTH BV	No	67	X		X								
25691	HAMILTON RD & STEELE CREEK RD	Yes	30	X										
7613	HEATHWAY DR & N TRYON ST	No	40	X		X								
23332	HOPETON RD & SHARON RD WEST	Yes	12			X								
19605	I-485 RA & I-485 RA_W ARROWOOD RD	Yes	17			X								
49037	I-485 RA & MOUNT HOLLY RD	Yes	37	X				X						
51265	I-485 RA & OLD STATESVILLE RD	No	36	X		X		X						
42521	I-485 RA & PROVIDENCE RD	Yes	47		X									
20766	I-485 RA & S TRYON ST	Yes	95	X										
47558	I-485 RA & STEELE CREEK RD	No	38					X						
51310	I-485 RA & W W T HARRIS BV	No	36					X						
1272	I-77 TO SAM FURR RA NB & SAM FURR RD_SAM FURR TO I-77 RA NB	Yes	36		X									
17062	IDLEWILD RD & MONROE RD_RAMA RD	Yes	77						X					
17138	IDLEWILD RD & PINEY GROVE RD	Yes	17			X								
51369	IKEA BV & UNIVERSITY CITY BV	No	40					X						
51491	INSTITUTE CR & N TRYON ST	Yes	53					X	X					
5600	J M KEYNES DR & N TRYON ST_UNIVERSITY HOSPITAL DR	Yes	34						X					
22200	JOHN PRICE RD & S TRYON ST	No	26	X										
47929	KENDALL DR & MOORES CHAPEL RD	No	11			X								
13341	KILBORNE DR & SUDBURY RD	No	10			X								
4175	LAKEVIEW RD & STATESVILLE RD	No	31	X				X						
8549	LASALLE ST & NEWCASTLE ST_NEWLAND RD	No	26	X										
16141	LATROBE DR & N WENDOVER RD	Yes	32	X		X								
4698	LAWING RD & MIRANDA RD_OAKDALE RD_SUNSET RD	No	35	X		X								
19055	LUMARKA DR & MONROE RD_THERMAL RD	Yes	26	X										
14596	MAGNOLIA AV & SOUTH BV	No	11			X								
4857	MALLARD CREEK RD & MEDICAL PLAZA DR	No	20					X						
3417	MALLARD CREEK RD & POLK AND WHITE RD	No	17			X								
31278	MALLARD GLEN DR & W MALLARD CREEK CHURCH RD	No	19					X						
11064	MARSHALL DR & WILKINSON BV	No	29	X	X									
9791	MATHESON AV & N TRYON ST_W 30TH ST	Yes	57							X				
11055	MATHESON AV & THE PLAZA	Yes	65	X										
6563	MCLEAN RD & MEADOW VISTA RD_OLD CONCORD RD	Yes	31	X		X								
13448	MERRIMAN AV & WEST BV	No	17			X								
11311	MILTON RD & N SHARON AMITY RD	Yes	81	X					X	X				
11290	MILTON RD & SUNRIDGE LN	No	15			X								
15064	MONROE RD & WASHBURN AV	Yes	20			X								
9396	MORETZ AV & N GRAHAM ST_W 28TH ST	Yes	27	X										
4560	MORNINGSTAR PLACE DR & N TRYON ST	No	14			X								

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19805	MORRISON BV & ROXBOROUGH RD_SOUTH PARK DR	Yes	16			X								
23437	MOSS RD & S TRYON ST	Yes	61	X										
45563	MOUNT HOLLY RD & MT HOLLY-HUNTERSVILLE RD	Yes	31	X										
10622	MULBERRY CHURCH RD & QUEEN CITY DR	Yes	44	X										
10714	MULBERRY CHURCH RD & S I-85 EXIT 33 RA	Yes	34	X										
43509	MULBERRY POND DR & TUCKASEEGEE RD	No	11			X								
12174	N CHURCH ST & S CHURCH ST_W TRADE ST	Yes	47						X			X		
12076	N CHURCH ST & W 5TH ST	Yes	44	X										
11981	N CHURCH ST & W 6TH ST	Yes	13									X		
14431	N COLONIAL AV & RANDOLPH RD_S COLONIAL AV	No	58	X										
11876	N GRAHAM ST & S GRAHAM ST_W TRADE ST	Yes	47	X										
11783	N GRAHAM ST & W 5TH ST	Yes	18						X			X		
11707	N GRAHAM ST & W 6TH ST	Yes	42	X										
11058	N I-77 EXIT 10B RA & N I-77 EXIT 10C RA_W 5TH ST	Yes	25	X										
11237	N I-77 EXIT 10B RA & W TRADE ST	Yes	57	X										
7621	N I-85 EXIT 39 RA & STATESVILLE AV	Yes	46	X										
7280	N I-85 EXIT 41 RA & W SUGAR CREEK RD	Yes	75						X					
14583	N SHARON AMITY RD & SPANISH QUARTER CR	No	26	X										
14014	N SHARON AMITY RD & WILORA LAKE RD	No	26	X										
6957	N TRYON ST & N US 29 BY-PASS HY_SANDY AV	Yes	42		X									
11265	N TRYON ST & WADSWORTH PL	No	17						X	X	X			
43234	NATIONS FORD RD & S I-77 EXIT 4 RA	Yes	41	X										
51243	NORTHCREST SHOPPING CENTER DR & NORTHLAKE WEST DR_W W T HARRIS BV	Yes	26	X	X			X						
1259	NORTHCROSS DR & SAM FURR RD	Yes	34		X			X						
48168	NORTHLAKE MALL DR & PERIMETER PY	No	33	X										
5816	OAKDALE RD & PLEASANT GROVE RD_RADIO RD	No	6					X						
10205	OAKLAWN AV & STATESVILLE AV	Yes	10						X					
7055	OLD MT HOLLY RD & ROZZELLES FERRY RD	No	14			X								
16439	OLD PINEVILLE RD & SCALEYBARK RD_SOUTH BV	Yes	43	X										
1321	OLD STATESVILLE RD & SAM FURR RD	No	29		X									
14183	OLD STEELE CREEK RD & WEST BV	Yes	31	X										
4297	OLD SUGAR CREEK RD & W W T HARRIS BV	No	42	X										
19337	PARK RD & PARK SELWYN OFFICE DR_SELWYN AV	Yes	25	X										
11639	PARKWOOD AV & PEGRAM ST	No	34	X										
28914	PINEVILLE-MATTHEWS RD & SPRINGBANK LN	No	29	X	X									
31626	PLAZA WALK DR & THE PLAZA	No	64	X										
17742	PROVIDENCE RD & S WENDOVER RD	Yes	53		X									
17032	QUEENS RD WEST & WESTFIELD RD	No	19										X	X
7380	REAGAN DR & W SUGAR CREEK RD	Yes	155						X			X		
13531	REMOUNT RD & WEST BV	Yes	47								X	X		
13752	RENSELAER AV & SOUTH BV	No	14						X					
48198	RIVERGATE PY & S TRYON ST	Yes	81					X		X				
12265	S CHURCH ST & W 4TH ST	Yes	38	X										
12721	S CHURCH ST & W HILL ST_W JOHN BELK RA	No	43	X										
11145	S I-77 EXIT 10B RA & W TRADE ST	No	25	X										
44542	S I85XCITY BV RA SB & UNIVERSITY CITY BV	No	22					X						
12680	S MINT ST & W MOREHEAD ST	Yes	25	X										
21549	S TRYON ST & SANDY PORTER RD	Yes	95	X										

ID	Location	Signalized	5-Year Collisions Total	Intersection Warrants					Pedestrian and Bike Warrants					
				Frontal Impact	Last Year Increase	Severity	Night	Chronic	Last 3 Years Peds	Night Peds	P-4	Last 3 Years Bike	X-4	
20640	S TRYON ST & WHITEHALL COMMONS CENTER DR_YAGER CREEK DR	Yes	60									X		
1274	SAM FURR RD & STATESVILLE RD	Yes	48		X				X					
44892	SAMS LN & UNIVERSITY CITY BV	No	19						X					
11567	SHAMROCK DR & TIPPERARY PL_WILLARD FARROW DR	Yes	26		X									
19242	SHARON LN & SHARON RD	Yes	38		X	X								
25034	SHOPTON RD WEST & YORK RD_YOUNGBLOOD RD	Yes	42		X									
21286	STEELE CREEK RD & WESTINGHOUSE BV	Yes	32	X										
5889	SUTHER RD & UNIVERSITY CITY BV	Yes	37		X									
45044	W SUGAR CREEK RD & W W T HARRIS BV	Yes	114					X						
14105	W TYVOLA RD & WALTER ST	No	10			X								
16298	W TYVOLA RD & YORKMONT RD	Yes	37	X										