

Control Measures	Cost of Implementation (1= least costly, 5= most costly)	Ease of Implementation (1=least difficult, 5= most difficult)	Expected Benefits (1=high benefits, 5=low benefits)	Responsible Parties	Recommendation/Status/Time frame
<b>Control Measures Recommended by Staff as a High Priority for Wake County and Other Organizations to Implement- Already Implemented</b>					
1. Support Triangle Air Awareness Program. (Page 15 of report)	1 No cost to join. Minimal staff time required to disseminate information during ozone season.	1 Easy to join. Wake County already has joined.	2 Educational benefits, improved awareness of air quality issues.	Wake County Environmental Services. Environmental education/environmental information providers	Already complete. Wake County Environmental Services joined October 2003. Information being incorporated into environmental education/ environmental information programs.
2. Support Triangle Clean Cities Coalition. (Page 15 of report)	1 No cost to join, minimal staff time required for staff involvement in program.	1 Easy to join. Wake County already has joined.	2 Benefits are increased awareness of alternate fuel opportunities, grants, and reduced emissions. (e.g. Biodiesel grant for incremental cost for Wake County fleet in 2003.) Increased potential for alternative fuel industry in NC.	Wake County Environmental Services and General Services Administration (GSA)	Already complete. General Services and Environmental Services are both members.
<b>Control Measures Recommended by Staff as a High Priority for Wake County and Other Organizations to Implement</b>					
3. Create a regional air quality agency through collaborative regional effort of governments, transportation entities and businesses. (Page 15 of report)	3 Primary costs are study, time, and cooperation to create the agency and staffing agency once it exists.	4 Ease depends on political leadership and willingness of local governments, transportation entities and businesses to work together. As an advisory group, could be created through interlocal agreements.	2 High potential benefits from cooperation on control strategies throughout region. Collaborative effort is essential for success.	Wake County Environmental Services, municipalities, Metropolitan Planning Organizations, public transportation providers, TJCOG, Greater Triangle Regional Council.	Recommend that Wake County collaborate with other local governments, transportation entities and businesses to foster regional cooperation in an organized manner in the next year. Board of Commissioner chairs from Triangle counties met in September.
4. Seek designation as a "Best Workplace for Commuters". (Page 15 of report)	2 Costs include staff time to administer the program, subsidies for transit and vanpool use, and emergency ride home.	2 EPA estimates requires 8 hours per month staff time to administer once program established.	1 Benefits are reduced Vehicle Miles Traveled (VMT) by employees. Experience of other Best Workplaces for Commuters shows that the program improves competitiveness in attracting and retaining employees.	Wake County Environmental Services Environmental Stewardship Network, Human Resources	Environmental Services staff and Environmental Stewardship Network are addressing this. Recommendations to be completed by spring of 2004. Wake currently provides some benefits, such as monthly subsidy for public transportation and vanpool users. Durham County government is a BWC.
5. Promote Ultra and Super Ultra low-emission vehicles (ULEV and SULEV). (Page 17 of report)	1 No incremental costs. Many vehicles already are SULEV and ULEV.	1 Easy to identify appropriate vehicles.	2 Vehicles run 77% to 95% cleaner than most vehicles sold today. Great decrease in nitrogen oxides (NOx).	NC Division of Air Quality, environmental education and environmental information providers	Recommended as a high priority in Wake County fleet replacement. Can be done any time vehicles are replaced.
6. Convert school bus fleets from diesel to Alternative Fuels. (Page 17 of report)	4 Low to Moderate costs. Method determines costs. Buses can use biodiesel fuel with an incremental cost of \$ 0.23 per gallon, be retrofitted for cleaner fuel burning, or be replaced with Compressed Natural Gas or Propane vehicles. Grant funds are available for first year.	1 & 4 Easy implementation for diesel, which can be stored in diesel tanks and for filter retrofits. New alternative fuel vehicles are more expensive.	1 High benefits from decreased NOx and fine particulate matter emissions and better health for students who are exposed to bus emissions.	WCPSS, Wake County Environmental Services, DENR	Recommended as a high priority, to encourage WCPSS to reduce pollutants from school buses. Currently pursuing grant funds in partnership with WCPSS for retrofitting school buses with filters to reduce emissions. Will also encourage purchase of alternative fuel vehicles for new buses.
<b>Control measures Recommended by Staff for Wake County and Other Organizations to Implement</b>					

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7. Implement Commute-trip reduction program. (Page 16 of report)	3 Costs include: Significant staff time to administer the program (Durham contracts with Triangle Transit Authority for three staff), costs to businesses to implement program, including reporting. Businesses that do not comply face fines.	4 Requires adoption of ordinance to require employers to comply. Would be easier to implement for RTP area than for whole county. Ordinance would also need to be adopted by municipalities. Would need to identify all employers above threshold level, work with them to achieve compliance.	1 High benefits. Could significantly decrease Single Occupancy Vehicle (SOV) usage during peak hours.	Wake County Environmental Services, Triangle Transit Authority, Greater Raleigh Chamber of Commerce, Capital Area Metropolitan Planning Organization	Recommend pursuing ordinance for RTP workplaces by summer of 2004 and working with Transportation Coordinating Committee on countywide ordinance, schedule to be determined. Durham County and City established a program in 2000.
8. On-line services. (Page 16 of report)	3 Costs include automation, development, maintenance and monitoring.	2 Easy to incorporate into existing web presence when development is completed.	4 Moderate expected benefits in reduced VMT.	Wake County E-government	Wake County is providing a number of services.
9. Bike/pedestrian facilities. (Page 16 of report)	5 Costs for retrofits of existing streets can be significant, ranging from additional lane width for bikelanes to creation of sidewalks where they do not exist.	4 Much easier with new facilities than with existing roads, especially if adequate right of way does not exist for facilities.	4 Small reduction in Single Occupancy Vehicle (SOV) Vehicle Miles Traveled (VMT).	NCDOT, Metropolitan Planning Organizations, municipalities	Recommended. Bicycle and pedestrian plan complete. Requiring improvements will be considered in rewrite of development regulations.
10. Fleets participate in Triangle Clean Cities Coalition. (Page 17 of report)	1 No cost to join, minimal staff time required for staff involvement in program.	1 Easy to join. Wake County already has joined.	2 Benefits are increased awareness of alternate fuel opportunities, grants, and reduced emissions.	Wake County Environmental Services and General Services Administration; TCCC; participating businesses	Implemented for Wake County government. General Services and Environmental Services are both members.
11. Enforce smoking vehicle law. (Page 17 of report)	1 Low cost. Existing Division of Air Quality reporting mechanism.	4 Moderate. Would require cooperation from local law enforcement agencies. Vehicle repairs are often very costly--difficult for low-income vehicle owners to repair.	5 Low benefits. Affects relatively few vehicles.	Not applicable	Recommend provide information on state program as part of environmental education/environmental information programs. Spring of 2004.
12. Require development of a plan to reduce energy use. (Page 18 of report)	2 According to EPA, use of Leadership in Energy and Environmental Design (LEED) standards in buildings has a lower or neutral incremental cost than traditional construction methods.	1 Wake County already has standards for County facilities in place.	4 Reduced energy consumption and life cycle costs for county facilities.	Wake County Facilities Design and Construction and General Services Administration.	Recommend continued use of Wake County Guidelines for Energy Efficient County Facilities. Standards in place since 1995. Currently being updated and will be used in new WCPSS buildings as well as new County construction.
13. Implement an urban heat island initiative. (Page 18 of report)	3 Costs include planting trees, installing white roofs and other elements.	2 Easier to implement upon initial construction than as a retrofit to existing development.	3 Reduces ozone creation through reducing heat in urban areas, less energy needed to cool buildings.	Wake County Facilities Design and Construction and Environmental Services	Triangle High Performance Guidelines include white roofs and Wake County includes appropriate landscaping in its developments. On-going process.
14. Accelerate replacement of gasoline powered equipment with electric equipment. (Page 18 of report)	2 Accelerated replacement schedule requires budget allocations for replacement equipment in an earlier fiscal year than usual.	5 Ease of implementation depends on the availability of reasonable replacements.	4 Less NOx, VOC, and PM	Wake County General Services Administration	Recommend pursuing options of electric engines, four stroke engines, and where alternative equipment is not available recommend the use of synthetic oils for two stroke engines, electric engines. On-going process.
15. Implement idling restrictions. (Page 19 of report)	1 Low cost of organizational awareness campaign, possible savings in fuel costs.	2 Law enforcement could have difficulty implementing restrictions. Others who use fleet should not. Would probably need to be on honor system.	3 Reduced idling emissions from fleet--NOx reductions. Raised awareness of air quality issues. Reduced exposure for children to emissions and particulate matter from diesel school buses. Possible fuel savings.	Wake County Environmental Stewardship Network, individual departments	Recommended highly for diesel school buses and where compliance does not adversely affect job duties. On-going process.

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16. Expand air quality education through a strong locally based program. (Page 20 of report)	2 Costs include training and materials for environmental educators.	1 Structures exist for education. Use and expand current strategies (e.g. EE/EI programs).	2 Highly benefits air quality awareness and education.	Wake County EE/EI program and Environmental Stewardship Network; NC Air Awareness Program	Recommended. ESN and EE/EI are incorporating air quality education into existing education programs. On-going process.
17. Implement a "stop at the click" program. (Page 20 of report)	2 Low cost-educational programs	2 Easy with cooperation of gas station operators.	4 Mostly educational benefits, raising awareness of different emissions sources and of air quality. Also reduces VOC emissions slightly.	Wake County EE/EI program and Environmental Stewardship Network; NC Air Awareness Program; gas station operators	Recommend incorporating into environmental education/ environmental information initiatives. On-going process.
<b>Control Measures Recommended by Staff that Require Collaboration with Others</b>					
18. Include air quality and energy conservation in transportation planning. Coordinate transportation planning with land use planning. (Page 16 of report)	1 Air quality is already included in transportation planning. Energy conservation is a by-product of decreasing congestion. Land use impacts are already part of the regional transportation model.	1 Air quality is already a part of Metropolitan Planning Organizations' planning efforts. Requires coordination between transportation planners and land use planners, both of which are represented on Metropolitan Planning Organizations.	2 High long-term benefits in reduced VMT. In addition, regional transportation model will be able to test land use options, allowing feedback loop between transportation and land use planning.	Capital Area Metropolitan and Durham-Chapel Hill Carrboro Planning Organization	Recommended. Transportation model is expected to be finished in fall of 2004. Concept of coordinating land use and transportation planning is also addressed in the Wake County Growth Management Strategy. On-going process.
19. Expand public transportation alternatives. (Page 16 of report)	5 Wake County is responsible for TRACS service. No outlay from Wake County government needed to support Triangle Transit Authority. TTA bus system is funded through a \$5 vehicle registration fee and Regional Rail System is funded by a 5% rental car tax.	5 TRACS is run through a contract for services, so it is easy to expand the system. Creating new Regional Rail Transit system is very complex because of the need to work with other rail services, adjacent properties, etc, in creating new rail system in exis	1 Benefits from decreased VMT and increased citizen mobility.	NCDOT, TTA, CAT, TRACS, C-Tran, DATA, Chapel Hill Transit, Metropolitan Planning Organizations	Recommended. Study of consolidation of public transportation systems has been done by Triangle Transit Authority. On-going process.
20. Early introduction of ultra-low sulfur fuels. (Page 17 of report)	3 \$.05 to .06 per gallon over existing fuel costs, as reported by NCDENR DAQ.	5 Requires regional approach including state agencies and local businesses and governments which maintain fleets.	2 Low sulfur fuels are needed for advanced pollution controls (catalytic converters) to be effective.	NC Division of Air Quality, Triangle Clean Cities Coalition, local businesses and governments	Recommended. EPA held a workshop in October to develop a plan for bringing 15 ppm ULSD into the Southeast earlier than the September 2006 EPA mandate as early as mid-Spring 2004.
21. Include air quality and energy conservation goals in the land use planning process. (Page 17 of report)	1 Costs are minimal for including these considerations in Land Use Plan process.	1 Should be easy to implement- land use planning is emphasizing mixed uses, pedestrian access.	2 Development patterns that require less use of SOV for access.	Wake County Planning and Environmental Services	Recommended as a long-term project. On-going process.
<b>Control measures Recommended by Staff Over which Wake County has little control</b>					
22. Traffic signal improvements. (Page 16 of report)	4 Costs can be significant, involving equipment, construction and computerization. Projects are eligible for Congestion Management and Air Quality (CMAQ) funds.	4 Involves significant changes to existing system. Ease depends upon sophistication of existing system.	1 Benefits are reduced congestion and idling due to better traffic movement. Reduces mobile emissions	NCDOT, Metropolitan Planning Organizations, municipalities	Recommended. Raleigh's computerized signalization needs updating. Cary and Garner will use CMAQ funds to computerize. Fiscal Year 2004-05.
23. Intersection improvements, including grade separation and roundabouts. (Page 16 of report)	5 Cost for grade separation is considerable. Roundabout costs are significant.	5 Grade separation is difficult. Experiments with roundabouts are being made now in Raleigh and Cary.	2 Benefits are reduced congestion and idling due to better traffic movement. Reduces mobile emissions	Metropolitan Planning Organizations, Municipalities and NCDOT	Recommended. On-going process.
24. Improved transit amenities. (Page 16 of report)	4 Moderate costs borne by transit organizations	1 Moderate- generally require permission to encroach on Rights of Way.	4 Increased ridership.	Public transportation providers	Recommended. On-going process.
25. Improved multimodal infrastructure. (Page 16 of report)	4 Moderate costs borne by transit organizations	2 Moderate- generally require permission to encroach on Rights of Way.	3 Increased ridership.	Public transportation providers	Recommended. On-going process.

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26. On-line trip planning services. (Page 16 of report)	2 Cost borne by TTA, other transportation systems.	1 Easy implementation.	4 Moderate benefits from reduced VMT due to increased knowledge, use of public transportation alternatives.	Public transportation providers	Recommended. <a href="http://www.gotriangle.org/">http://www.gotriangle.org/</a> is operational for transit. Trip planning service adding carpools and vanpools to be operational in March 2004.
27. High-Occupancy Vehicle lanes. (Page 17 of report)	5 I-40 from NC 86 to US 1 and 64 estimated to cost between \$237 million and \$649 million, depending on dedication of HOV lanes and access ramps.	5 Right of Way exists on I-40 now. EIS process required.	1 Could reduce SOV travel by up to 2% and overall peak period VMT by 3%, provides incentives for ridesharing and transit.	NCDOT, Metropolitan Planning Organizations	Recommended. NCDOT has completed study of HOV lanes for I-40 in a Congestion Management Study and is in process of collaborating with local agencies and planning organizations on next steps.
28. High-occupancy Toll Lanes. (Page 17 of report)	5 Added cost to HOV to account for toll collection system.	5 May be difficult to implement. NC has created a toll road authority, which will operate a few toll roads.	1 Greater use of high occupancy lanes than might exist with non-toll HOV lanes.	NCDOT, Metropolitan Planning Organizations	Recommend that HOT lanes be considered in HOV studies. On-going process.
29. State incentives for alternative fuel vehicles, alternative fuels and refueling infrastructure. (Page 17 of report)	4 Refueling infrastructure is expensive. Alternative fuel vehicles and alternative fuels are more expensive than conventional ones.	5 Difficult implementation due to political constraints and tight budget.	2 Increased use of alternative fuels, lowered NOx emissions for most. Increased markets for agricultural products.	NC General Assembly	Recommended. Representative Tolson has introduced legislation in the past two sessions, without passage, HB 806 last session. To be introduced again in next legislative session.
30. RDU to operate alternative fuel (AF) administrative and maintenance vehicles, equipment and AF shuttles from the passenger terminal to the surface parking lots. (Page 19 of report)	3 Will need to be determined by RDU Airport Authority.	To be determined by RDU Airport Authority.	2 Reductions in NOx, VOC, and PM.	RDU Airport Authority	Recommended. On-going process.
31. RDU to create voluntary emission reduction agreements between agencies and the airlines. (Page 19 of report)	1 Will need to be determined by RDU Airport Authority.	To be determined by RDU Airport Authority.	4 Reductions in NOx, VOC, and PM.	RDU Airport Authority	Recommended. On-going process.
32. RDU voluntary replacement of Airport Ground Support Equipment: conversion to electrical vehicles. (Page 19 of report)	3 Will need to be determined by RDU Airport Authority.	To be determined by RDU Airport Authority.	2 Reductions in NOx, VOC, and PM.	RDU Airport Authority	Recommended. On-going process.
33. RDU to ensure that airport emissions are "bubbled" and cap emissions. (Page 19 of report)	1 Will need to be determined by RDU Airport Authority.	To be determined by RDU Airport Authority.	2 Reductions in NOx, VOC, and PM.	RDU Airport Authority	Recommended.
34. Conduct a new marketing campaign to promote transit and other shared-ride alternatives for traveling to RDU. (Page 19 of report)	2 Low cost. Public awareness campaign.	2 Easy to market to Triangle area, if funds are available.	3 Reduced SOV travel to RDU.	Triangle Transit Authority and other public transportation systems	Recommend that public transportation providers pursue this strategy. On-going process.
35. Free bus rides on ozone action days. (Page 19 of report)	3 Moderate to high. Costs borne by transit organizations.	2 Cost could be a barrier to implementation but actual program would be relatively easy to implement.	3 Less use of automobiles on ozone action days, possibly encourage more use of public transportation in future.	Public transportation providers	Recommended. Next ozone season. (May 2004)

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<b>Control measures that Require Further Study</b>					
36. Develop a Memorandum of Agreement between local governments, businesses and NC DENR Division of Air Quality for a voluntary emission reduction program. (Page 17 of report)	1 Primary cost is preparing program, implementation measures.	2 Will require coordination with DAQ staff to develop programs for each entity that agrees to MOA.	4 Governments and businesses to get credit in State Implementation Plan for measures taken to improve air quality. Encourages proactive approach to reducing emissions.	Local governments, businesses and NC DENR Division of Air Quality.	Further study is needed.
37. Accelerate the replacement of on-road diesel fleets with new engine technology. (Page 18 of report)	3 Wake on-road diesel replacements for trucks would average \$35,000 dollars/vehicle less the salvage value (10-20% of original value) of replaced vehicles.	2 Would require additional budget allocations for early fleet replacement.	1 Less NOx, VOC, and PM, provided old vehicles are not bought by fleets in the region.	Wake County General Services Administration	Recommend purchase of advanced engine technology equipment as fleet is replaced. Recommend further study on costs of replacement relative to benefits of the engine technologies scheduled for introduction in 2004 and 2007. On-going process.
38. Accelerate the replacement/turnover of non-road diesel fleets with new engine technology. (Page 18 of report)	3 Accelerated replacement schedule requires budget allocations for replacement vehicles in an earlier fiscal year than usual.	4 Owners might not comply unless required. Selling vehicles out of the area poses problems.	1 Less NOx, VOC, and PM, provided old vehicles are not bought by fleets in the region.	Owners of fleets with non road diesel fleets	Recommend further study on costs of replacement relative to benefits of the engine technologies scheduled for introduction in 2004 and 2007 and barriers to implementation. On-going process.
39. Schedule construction, landscaping, and mow activities after noon on ozone action days, or to non ozone-action days. (Page 19 of report)	2 Costs involve rearrangement of shifts and higher exposure of workers if work is required during ozone action days in the afternoon.	4 Difficulty in implementing is due to business considerations of organizations involved.	4 Limited benefits in NOx reduction.	Wake County General Services Administration	Requires further study of business costs relative to benefits. May 2004.
40. Promote Efficient Freight Transport. (Page 20 of report)	? Cost borne by Freight operators.	? Requires scheduling and equipment changes.	? Reduced emissions from less idling time and fewer VMT.	Freight and delivery systems	Recommend further study before encouraging implementation.
41. Require contractors to achieve emission reductions for the non-road diesel equipment used during construction project. (Page 18 of report)	4 Increased costs for contractors to acquire diesel equipment meeting EPA standards.	5 May result in contractors opting out of making proposals for Wake County projects. Would require that Wake County monitor equipment used on construction sites, which	1 Less NOx, Volatile Organic Compounds (VOC), fine particulate matter (PM).	Wake County Facilities Design and Construction and Environmental Services	Not recommended.
<b>Control measures that Staff Does Not Recommend</b>					
42. Encourage the public to check gas cap leaks and replace the cap if it is found leaking. (Page 17 of report)	1 Low cost. For all vehicles made after 1996, an On Board Diagnostics system identifies any emissions leaks automatically.	2 Easy implementation. Would involve public ad campaign to raise awareness.	5 Low benefits. Decreases NOx marginally.	Not applicable	Not recommended. On Board Diagnostic systems address this need.
43. Implement a Cool Cities program. (Page 18 of report)	3 Similar to heat island initiatives.	3 Similar to heat island initiatives.	3 Similar to heat island initiatives.	Not applicable	Not recommended- urban heat island initiatives fulfill the same function. Formerly but no longer used by City of Houston, TX.