Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program

What is the SOON program and what is its purpose?

The In-Use Off-Road Diesel Vehicle Regulation (off-road regulation) includes a program designed to achieve additional oxides of nitrogen (NOx) emission reductions called the SOON program. Local air districts may opt into this program to reduce NOx emissions beyond what is required by the off-road regulation.

Before April 2, 2009, participation by fleets is voluntary. For SOON program solicitations with deadlines on or after April 2, 2009, an air district may choose to make participation by fleets voluntary or mandatory.

Larger fleets that operate vehicles in air districts participating in the SOON program may be required to apply for incentive money, and – if they receive the money – to take additional actions to reduce NOx emissions.

What fleets will be affected by the SOON program?

If a district makes the SOON program mandatory, fleets that contain off-road diesel vehicles and are subject to the off-road regulation must apply to the SOON program if they are larger than 20,000 horsepower (hp), contain vehicles that operate a majority of the time in a participating SOON air district, and consisted of more than 40 percent Tier 0 and Tier 1 vehicles statewide in 2008. Other fleets that operate within the district, but do not meet remaining criteria, are allowed to apply for SOON funding if they wish; however, it is not required.

What is the structure of the SOON program?

If an air district opts into the SOON program, it will issue a solicitation for applications for funding within that air district. If the district makes the SOON program mandatory, and a fleet contains vehicles within the air district meeting all SOON criteria, on the due date indicated in the solicitation, the fleet must report the applicable vehicles to the air district. The SOON criteria are as follows:

1) The fleet currently operates individual vehicles within a participating SOON air district and, during the past three years has operated vehicles more than 100 hours per year within the boundaries of the air district and in that air district more than in any other air district;
2) As of January 1, 2008, on a statewide level, the fleet consisted of more than 40 percent Tier 0 and Tier 1 vehicles; and
3) The fleet on the date of solicitation has a statewide fleet with maximum power greater than 20,000 horsepower.

Fleets not meeting the SOON criteria above are not required to apply for SOON funding; however, they can choose to apply for SOON funding if:

1) They operate vehicles within a SOON district; and
2) They do not meet the applicable SOON NOx target rates.

If a fleet is not required to participate in the SOON program, but chooses to do so anyway, the fleet has no obligation to participate in the SOON program in any subsequent year.

If the district makes the SOON program voluntary, a fleet may decide whether or not to participate.

Fleets that are required to participate in SOON or that choose to do so must submit the same vehicle information required by the off-road regulation. In addition to the required vehicle reporting, each fleet must calculate and report the NOx index and SOON NOx target rate for the vehicles that operate in the air district. The SOON NOx target rates are shown below in Table 1.

Table 1: SOON NOx Targets for each Max Hp Group (g/bhp-hr)

Compliance Date: March 1 of Year	Horsepower Groups							
	25-49	50-74	75-99	100-174	175-299	300-599	600-750	>750
2011	5.6	6.2	6.7	6.0	5.4	5.1	5.3	6.4
2014	4.9	5.1	5.2	4.7	2.8	2.7	2.7	4.2
2017	4.2	4.1	3.8	3.4	1.5	1.5	1.5	3.2
2020	3.5	3.2	2.4	2.2	0.9	0.9	0.9	2.6
2023	3.5	3.2	2.4	2.2	0.9	0.9	0.9	2.6

The NOx index and SOON NOx target rates for the applicable vehicles in the air district are calculated with the formulas included in the off-road regulation. For mandatory SOON programs, fleets for which the NOx index is greater than the SOON NOx target rate, as calculated from the target rates in Table 1, must apply for SOON funding.

Fleets can apply for funding for NOx exhaust retrofits, repowers, vehicle replacements[1], or other actions to decrease the NOx index for the applicable vehicles operating within the air district. The NOx index must be decreased from where it would have been (under compliance with the off-road regulation) to less than or equal to the SOON NOx target rate calculated from Table 1[2]. Fleets that apply but do not receive requested SOON program funding are not required to take actions beyond compliance with the off-

[1] In the current 2005 Carl Moyer guidelines, funding is not available for off-road equipment replacement (ARB, 2006); however, an off-road equipment replacement program may be considered for the 2008 Carl Moyer guidelines. Therefore, off-road vehicle replacement could be a possibility for future SOON funding.
[2] If NOx exhaust retrofits, repowers, or vehicle replacements are not available for the applicable SOON vehicles, the SOON NOx targets do not have to be met.

road regulation. A flow chart of the actions a fleet in a mandatory SOON program must take is shown in Figure 1.

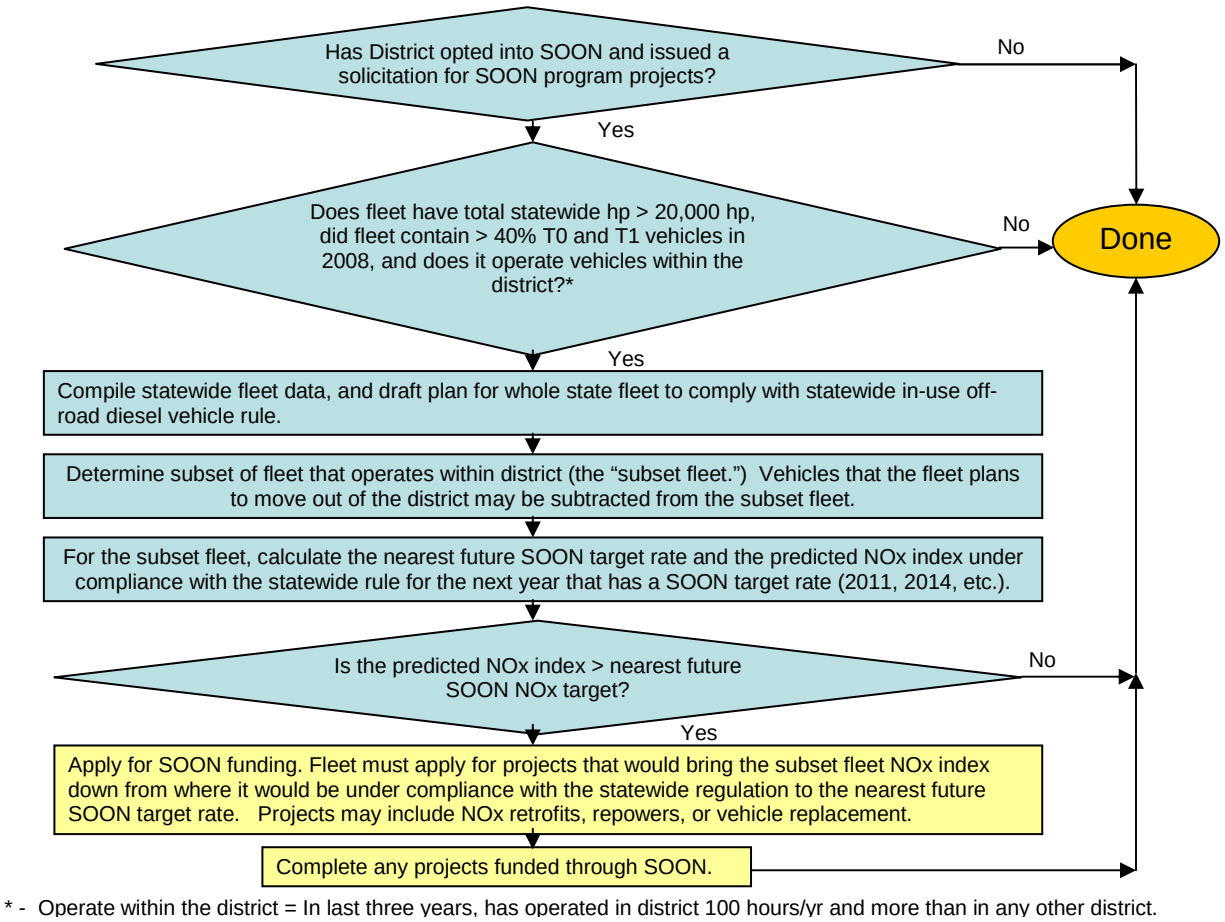

Figure 1: Actions for Fleets in Districts that Opt into a Mandatory SOON program.

ARB has sole authority to enforce the requirements of the SOON program (section 2449.3). Also, before any district SOON program guidelines take effect, the Executive Officer of the ARB must review and approve them.

How does the SOON program interact with the off-road regulation?

The SOON program is intended to achieve emission reductions beyond those already expected from the off-road regulation. Reductions achieved through the SOON program must therefore be surplus, to those required by the off-road regulation. During the contract period, vehicles that receive SOON program funding for NOx exhaust retrofits or repowering with new engines, or vehicle replacement , cannot use this lower emission rate to calculate NOx indices, particulate matter (PM) indices, NOx target rates, PM target rates, turnover credit and exhaust retrofit credit under the off-road regulation. Instead, for the purposes of calculating the above, these vehicles must be reflected as if the actions taken under the SOON program did not occur. However, actions taken using SOON program funding may be used for determining compliance for the off-road regulation after the SOON program project period has expired for that vehicle.

What are the expected emissions benefits of the SOON program?

The SOON program will achieve NOx and PM emission reductions beyond those expected from compliance with the in-use off-road diesel vehicle regulation. The amount of emission reductions achieved will depend on the level of funding in each air district, on the cost-effectiveness of the SOON projects funded, and on how the SOON program is assumed to interact with the statewide in-use off-road diesel vehicle regulation.

The South Coast District Governing Board Administrative Committee has indicated it plans to fund SOON at $30 million dollars per year for four years. At that level of funding, staff estimates that in year 2014, the South Coast will achieve between 5 and 12 tons per day in additional NOx emission reductions. In addition, for each repower funded through the SOON program, PM emissions per engine will be reduced by approximately 70% (assuming that a Tier 0 engine is replaced with a Tier 3 engine). Therefore, staff estimates that in year 2014, an additional 0.2 tons per day of PM reductions in the South Coast will occur due to the SOON program. Once each SOON project contract period ends, the emission benefits of the project also end because the actions taken under SOON become creditable under the off-road regulation.

Staff has not quantified emission benefits of the SOON program in air districts other than the South Coast, because it is not clear which additional air districts will opt in, or what the level of funding will be in these other air districts. As additional air districts opt in to the SOON program, NOx and PM benefits will occur in each participating air district and will last through the end of the SOON projects' contract periods.

What up-front costs will the SOON program impose on participating fleets?

Although most of the SOON program costs will be funded by the air districts (according to existing funding guidelines such as those for the Carl Moyer program) and although participating fleets will see a long-term economic benefit from receiving SOON funding, there will still be up-front costs incurred by the fleets participating in the program in the year they receive SOON funding. As discussed further below, these costs include administrative costs, as well as the fleet's portion of costs for engine repowers or vehicle replacements[1]. Fleets have to pay a portion of the repower or replacement costs because SOON will largely be funded with Carl Moyer program funds, which statute limits to just the incremental cost beyond normal business costs. Thus, fleets will be responsible for the portion of project costs that they would have faced anyway during the normal course of business.

In some instances, a fleet participating in the SOON program may face slightly higher compliance costs with the statewide regulation than it would otherwise. This is because SOON may force fleets to change their plans for compliance with the statewide regulation, thereby forcing them to choose actions for statewide rule compliance that are more expensive.

Once each SOON project contract period ends, the participating fleet will realize an economic benefit in that it will essentially get back more than it contributed to participate in SOON because it will be able to credit actions funded by SOON toward fleet compliance with the off-road regulation. For example, if a fleet pays 15 percent of a SOON project repower cost and the remaining 85 percent is paid with SOON funding, once the contract period ends, the fleet gets to credit the repower toward compliance with the off-road regulation and therefore would need to spend less than it otherwise would for compliance with the off-road regulation. At the conclusion of all SOON project contract periods, the SOON program overall will have made the off-road regulation more affordable for participating fleets, assuming that the fleets continue to operate throughout the end of the SOON project contract periods.

Although the SOON program will ultimately lessen the costs of compliance for participating fleets, the SOON program could also potentially increase the estimated cost of the off-road regulation in its initial years of implementation by a small amount (less than one percent). This is because staff expects that the SOON program will fund the most cost-effective projects in a fleet (such as older Tier 0 vehicles[3]) earlier than they would be controlled through the statewide requirements in the off-road regulation. Because these vehicles will now be included in the SOON program, fleets will need to control less cost-effective vehicles (such as newer Tier 1 vehicles) for compliance with the off-road regulation. Even with the slight increase in the regulatory cost of the regulation, staff expects that the regulation remains cost-effective and is still within the cost-effectiveness range of previous measures adopted by ARB.

Repower Costs

When a fleet receives SOON funding for a repower, it will be responsible for a small part of the repower cost because most, if not all, of the SOON program funding will be supplied through the Carl Moyer program. Under the Carl Moyer guidelines (ARB, 2006), only the incremental cost (i.e., the cost beyond that expected during the normal course or business) of cleaner-than-needed equipment can be paid with Carl Moyer funds to achieve early or extra emissions reductions. When an engine repower is funded, it is assumed that the repower is occurring at the time of normal engine rebuild, and Carl Moyer funds may only be used to pay the portion of the repower cost beyond the assumed cost of rebuild. Thus, fleets must contribute towards each repower funded at a level that is equivalent to the assumed cost of an engine rebuild.

For this analysis, we assumed that the contribution for fleets would be approximately 15 percent of the repower cost.[4] Staff assumed that most of the participating fleets will use repowers to meet the SOON NOx targets, and that on average, the air district will

[3] Older Tier 0 vehicles are more cost-effective relative to newer vehicles to turn over because they have less useful life remaining and because of the large emission reductions associated with repowering Tier 0 engines to a Tier 3 level. Tier 0 vehicles are required to be turned over first in the off-road regulation if a fleet is on the BACT path. Therefore, when the cost analysis was performed for the off-road regulation, it was assumed that these vehicles were turned over first at little cost to the fleet (ARB, 2007b).

[4] Based on Carl Moyer project costs over the past 6 years for Tier 3 repowers, rebuild costs are equivalent to about 15% of the total cost of the repower.

pay 85 percent of those repower costs. Therefore, for every $1 of SOON funding spent by the air districts, fleets will be responsible for $0.18.[5] (In other words, SOON fleets receive $5.67 cents in SOON funding for every dollar spent by the SOON fleet on repowers.)

SOON funding guidelines should include an ability to fund the full cost for fleets that demonstrate that they have recently rebuilt the engine of the vehicle being repowered through SOON. For such recently rebuilt vehicles, it could reasonably be argued that the fleet would not have incurred rebuild costs during the normal course of business, and thus that the entire repower cost should be eligible for Carl Moyer funds. ARB staff will work with air districts opting into SOON to address this situation in the SOON program guidelines.

Although there will in most cases be an upfront contribution for a fleet to participate in the SOON program, the repowers acquired with SOON funding will eventually be used for compliance with the statewide off-road regulation once the SOON project period is completed. Therefore, even though there may be an initial cost for a fleet to participate in the SOON program, overall, the money spent will help the fleet meet their off-road regulation requirements. In addition, because the SOON program will be paying the incremental cost of a repower, and that repower can eventually count towards off-road compliance, a fleet receiving SOON funding will be spending less total money overall for compliance with the off-road regulation.

Retrofit Costs

The 2005 Carl Moyer guidelines require that the highest level verified diesel emission control strategy (VDECS) be installed with every repower funded (ARB, 2006); however, the SOON program will not fund, and will not require VDECS installations on SOON vehicles

Administrative Costs

In addition, fleets will incur costs due to recordkeeping and paperwork associated with the application process of the SOON program. It is estimated that these administrative costs will be approximately $100 per vehicle funded through SOON, or about $1,000[6] per year for a large fleet that receives funding for 10 vehicles per year. These costs are in addition to the administrative costs of the off-road regulation. For the South Coast air district, total administrative costs for all participating fleets are expected to be approximately $55,000 per year.

Total Costs

[5] If a district funds 85 percent of a repower cost, that is equivalent to funding $0.85 out of every dollar spent on a repower. Therefore, for every $1 spend by the district, a fleet will spend $(0.15/0.85) or $0.18.
[6] Based on an average cost of $50/hr of lost work time, or hired help, to record and submit the required SOON funding applications.

Table 2 shows the anticipated costs that will be incurred by both air districts and individual fleets that participate in the SOON program as well as the cost savings fleets should realize over the life of the regulation. The costs incurred by the South Coast air district are based on the estimate that approximately $30 million per year (for the next four years) will be spent in the South Coast on SOON funding.

Table 2: Fleet and Air District Costs for the South Coast SOON Program

Who Is Affected	Air District Contribution	Fleet Up-Front Costs	Fleet Cost Savings
An individual fleet	$230/hp	$41/hp	$229/hp
Total for all fleets in South Coast air district	$30.0 million per year for four years	$5.3 million per year for four years	$29.9 million per year for four years

If other air districts opt into the SOON program, staff believes that the costs and cost savings there will be comparable for participating fleets in those districts as well. As stated above, staff has not quantified costs in districts other than the South Coast because it is not clear which additional air districts will opt in, or what the level of funding in other air districts will be. However, the total cost for all fleets in an air district will depend on the level of SOON funding in each air district.

How might SOON affect a fleet?

The following example illustrates how a hypothetical fleet, Fleet A, would potentially comply with the off-road regulation statewide performance requirements and the SOON program. Fleet A is a fleet with an average vehicle age of 11 years and approximately 900 vehicles totaling 100,000 hp.

In this example, it is assumed that Fleet A operates solely within one air district, and that air district is participating in a mandatory SOON program. Although 2008 is a voluntary year for all air districts participating in SOON, Fleet A decides to participate, and reports all of its vehicles to the one air district. Once the air district announces a solicitation for SOON program funding in 2008, Fleet A would submit a compliance plan to show how it proposes to meet the off-road regulation's statewide performance requirements for the three years between the SOON solicitation deadline and the next year in which there is a SOON target rate. For example, if a SOON funding solicitation is released in 2008, a fleet would need to submit how it will comply with the statewide performance requirements in years 2009, 2010, and 2011.[7] Since the first compliance date of the off-road regulation is not until 2010, the fleet would only need to show what

[7] This example assumes that districts will ask for a three-year compliance plan. Districts may ask for a compliance plan with a longer planning horizon, such as six years. If that were the case for this example, Fleet A would need to submit a plan showing the actions it intends to take to comply with the off-road regulation through 2014, and then look at what additional actions would be necessary to meet the SOON NOx target in 2014.

actions it intends to take in years 2010 and 2011 to comply with the statewide requirements. These actions would include the number of PM/NOx exhaust retrofits, turnover, repowers, or vehicle retirement needed to meet the statewide NOx and PM fleet average targets or meet the minimum BACT requirements of the off-road regulation. In this example, according to Fleet A's compliance plan, it would need to turn over 72 vehicles to comply with the statewide requirements between March 1, 2009, and March 1, 2010, and then by March 1, 2011, turn over an additional 53 vehicles. The off-road regulation's statewide compliance schedule for Fleet A is shown in Table 3.

Table 3: Compliance path for Fleet A

Calendar Year	Compliance path for off-road regulation (vehicles turned over to meet fleet average targets):
2010	72
2011	53

After a compliance plan has been established, Fleet A would then look at what additional actions would be necessary in the nearest future SOON target year (in this case, 2011) to meet the SOON NOx target. In 2011, Fleet A establishes that it must turn over three additional vehicles (above the 53 vehicles turned over to meet the off-road regulation requirements) to meet the 2011 SOON NOx target. Since the retirement of three vehicles would be necessary in 2011 to meet the SOON NOx target, those three vehicles are eligible for SOON funding starting in 2009. If funding is not received for all three vehicles, Fleet A would have to reapply in 2010 and 2011 for SOON funding for any of those three vehicles not originally funded in 2009 (reapplying only necessary in districts requiring mandatory participation in SOON). If funding is received for all three vehicles in 2009, then no actions would be required of Fleet A for the next two years. In 2011, Fleet A would need to submit a new compliance plan to meet the 2014 SOON targets (in the same way the application for funding was filed for compliance with the 2011 SOON NOx targets). Table 4 shows the actions Fleet A needs to take to comply with the SOON program.

Table 4: SOON Requirements for Fleet A

Calendar Year	Actions Required
2008	Air district solicitation occurs, and 1st applications for funding are due. Since three vehicles are eligible for SOON funding, Fleet A submits an application for those three vehicles. Action must be taken on any vehicle that receives SOON funding.
2009	Air district solicitation occurs, and 2nd applications for funding are due. If not all of the three vehicles were funded in 2008, Fleet A must apply for funding for the remaining vehicles again; if all vehicles were funded in 2008, no actions are required. Action must be taken on any vehicle that receives SOON funding.
2010	Air district solicitation occurs, and 3rd applications for funding are due. If not all of the three vehicles were funded in 2008-2009, Fleet A must apply for funding for the remaining vehicles again; if all vehicles were funded in 2008-2009, no actions are required. Action must be taken on vehicle that receives SOON funding.
2011	Air district solicitation occurs, and 4th applications for funding are due. If not all of the three vehicles were funded in 2008-2010, Fleet A must apply for funding for the remaining vehicles again; if all vehicles were funded in 2008-2010, no actions are required. Action must be taken on any vehicle that receives SOON funding.

Could the SOON program have unintended environmental impacts?

To guard against unintended environmental impacts that could occur if fleets attempted to manipulate their fleet, the SOON proposal includes language that prevents fleets from moving older, higher emitting vehicles into a participating air district simply to seek funding. As proposed, a vehicle must have operated in the participating air district for three years before applying for SOON money, and additionally, must show that the vehicle has operated in that district more than any other district. Also, the vehicle must operate over 100 hours per year, which would prevent fleet operators from bringing in equipment into the air district with the intent to not operate those vehicles at all. Because of these provisions, staff does not believe that the SOON program will result in emissions increases in any participating district.

References

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