and initial idle. The LA4 cycle used in the current FTP brings the most aggressive operation close to the beginning of the cycle; driving survey data suggest this is atypical of in-use operation. The second concern was microtransient behavior (rapid speed fluctuations). In-use driving survey data contains more frequent speed fluctuations than the FTP.

The Agency identified concerns about four additional elements of the FTP: The duration of the soaks; the representation of A/C load; representation of additional loads on the engine due to factors such as road grade, extra cargo, or trailer towing; and the adequacy of the dynamometer specification for representation of real road load.

With respect to soaks, EPA sought to determine if significant levels of emissions are missed by the current FTP because only very short- and long-duration soaks are reflected in the current structure. One related hypothesis was that the much faster cooling rate of catalysts compared to engines might lead to excessive emissions during intermediate-duration soaks.

Several aspects of the A/C load simulation were problematic. The current FTP adds load as a percentage of the base road load horsepower curve, which means the FTP A/C load decreases with decreasing speed, while real A/C system loads relative to road load horsepower are highest at low speed. Also, vehicles with different base horsepower curves end up with different FTP A/C load simulations, even if they have identical A/C systems. Additionally, the Agency believes that the current method significantly under-represents the magnitude of in-use A/C loads. As in the case of aggressive driving behavior, incorrect representation of A/C loads during the FTP risks incorrect simulation of the emissions these loads would generate from an engine in-use.

Road grade, vehicle towing, and cargo also represent a load effect on the engine. The 300-pound passenger-plus-cargo allowance on the FTP is clearly unrepresentative for some driving situations, especially for trucks, and the absence of road grade or vehicle towing simulations on the FTP means these actual in-use loads are not a factor determining emission standards or compliance with those standards.

Three aspects of the current FTP dynamometer configuration have the potential to misrepresent the actual road load experienced by vehicles in-use. First, the shape of the speed/load curve on current certification dynamometers is fixed and cannot be changed; the magnitude of the speed/load curve is adjusted by periodically calibrating the dynamometer at a single speed (currently, 50 mph). As a consequence, loads at speeds other than the calibration point can be misrepresented. Second, current FTP dynamometers cradle the vehicle drive wheels between two small (8.65-inch) rolls. Heating effects and pinching of the tire result in an unrepresentative simulation of road ''surface.'' Third, the dynamometer rolls are currently uncoupled and the front roll (which bears the power absorber) spins somewhat more slowly than the rear (which provides the vehicle speed signal); this tends to bias the system towards underloading the vehicle.

The Agency analyzed three other elements of the FTP and believes revising the current procedures is unnecessary at this time. The first such area was the altitude of testing. Given that EPA has the authority to perform vehicle testing at any altitude, and it currently exercises that authority, the Agency is not proposing to supplement by further regulation the altitude testing flexibility in current law. While it is possible that driving behavior may differ at high altitudes, EPA believes that any emission controls required for aggressive driving will also be effective during high altitude driving.

A second element which EPA did not pursue beyond the initial evaluation was test fuels. In-use fuels have a wide range of properties. This specification for fast fuel allowance for a range of fuels (40 CFR 86.113–94) appear to provide EPA with the flexibility to use a variety of test fuels ranging from an average in-use fuel to some of the less typical in-use fuels with qualities that could effect emissions. Significant differences, with potentially large emissions implications, do appear to exist between average in-use gasoline and the gasoline (indolene) typically purchased by both EPA and industry for certification testing. After evaluating approaches to addressing this situation, EPA concluded that changes to the regulations are not necessarily required, since the current regulations provide the flexibility needed to address those situations where the use of indolene may not be representative. In addition, various programs to address in-use fuel qualities are still under consideration. If a decision is ultimately made to change the certification fuel regulations, it may be best to do so along with changes to the specifications for in-use fuels.

Finally, EPA believes that it is unnecessary to further address the direct impacts of ambient temperature on FTP tailpipe emissions in this proposal. At the time the Amendments were adopted, the FTP evaluated tailpipe emissions performance in the midrange of temperature (68° F to 86° F), but omitted both cold and hot temperature testing. The emission concern following cold temperature soaks and during cold temperature operation is increased CO emissions. This concern was addressed through EPA's Cold Temperature CO rulemaking (57 FR 31888). The direct emission impact during hot temperature operation is increased fuel evaporation. Ambient temperature should not otherwise affect tailpipe emissions, as the engine and combustion temperature are not affected in any significant way by temperatures hotter than 86° F. This concern was addressed through the Agency's Evaporative Emissions rulemaking (58 FR 16002). Ambient temperature also produces indirect emission effects through increased operation of the vehicle A/C, affecting the load on the engine. This indirect aspect of temperature was addressed in EPA's detailed review of the FTP and is reflected in today's proposal.

The FTP Review project team found that existing information was clearly inadequate for evaluating potential revisions to the test procedures. Consequently, a number of new data gathering and analytical efforts were undertaken in connection with the project. In several of these efforts, EPA resources were supplemented by significant cooperative investments from other sources, including the American Automobile Manufacturers Association (AAMA), the Association of International Automobile Manufacturers (AIAM), and the California Air Resources Board (CARB). These studies provided EPA with unprecedented data on which to base its comparative review with the FTP and to construct the options presented in today's proposal.

VI. In-Use Behavior

The first critical need in reviewing the FTP was a current database on in-use driving and vehicle soak behavior. The Agency collaborated with AAMA, AIAM, and CARB over the spring and summer of 1992 to conduct surveys of in-use driving and soak behavior in four major U.S. cities.

A. In-Use Driving Behavior

Instrumented vehicle surveys and/or chase car studies were conducted in Baltimore, Maryland; Spokane, Washington; Atlanta, Georgia; and Los Angeles, California. In May of 1993, EPA published its initial conclusions regarding aggressive driving behavior in the ''Federal Test Procedure Review Project: Preliminary Technical