The planetary science community eagerly awaits the first close-up, high-resolution observations of Titan by Cassini/Huygens (C/H). From those observations we expect significant advances in our knowledge of all aspects of Titan, we expect surprises, and the knowledge we gain will allow better optimization of instruments for a follow-on mission. Thus after 2005 we expect strong motivation for a follow-on mission that focuses on Titan. Since late 2000 JPL and other NASA centers have studied options for a Titan-focused C/H follow-on mission. Initial studies in late 2000 and 2001 by a team at JPL (R. Kakuda, team lead) examined post-Cassini/Huygens science objectives, and high-level design parameters of a mission to address those objectives. Though the study concentrated mostly on a Titan orbiter, it included a black-box “in situ element”, which could be a simple lander or a balloon, blimp, or some other form of instrumented mobile platform, needing telecommunications relay by the orbiter. In 2002 studies by a team consisting of experts from several NASA centers and lead by M.K. Lockwood of NASA’s Langley Research Center, detailed the system design, configuration, and performance of an aerocaptured orbiter that also delivers an in situ element. This team made fairly conservative assumptions concerning materials, equipment, and software, so implementation of its design would not require a huge technology development program. Current and future studies will focus on the in situ element, taking it from a black box with an allocated mass to a system design for the chosen platform, with instruments. This paper will summarize results of the 2002 studies, and describe potential science opportunities and advantages of the aerocaptured mission.

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